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POLYGALA ALBA.

By John M. Maisch.

In the September number, 1889, of the American Journal of Pharmacy, I gave, briefly, a history of the origin of a false senega root, which has been in the market from time to time since 1876, and which, mainly from the close resemblance in the anatomical structure, was supposed by me to be obtained from *Polygala Boykinii*, until a specimen of *Polygala alba*, with roots and flowering stems was procured, the root of which corresponded *in every particular* with the false senega then offered to a wholesale dealer, and with the several specimens of the same root received by me at various times since 1876; moreover, this plant was procured in the same locality and from the same shippers through whose hands *a few bales of this root had been sold annually to dealers and manufacturers.* There could be no question that the plant was really the one from which the false senega is derived; it was found to be Polygala alba, *Nuttall*, as stated in my previous paper, and was recognized as a robust form of this species also by Professor John M. Coulter, of Wabash College, whose reply to my inquiry had been delayed, owing to his absence from home, and did not reach me until after the publication of my paper in September, 1889. About the same time I learned also that the same plant had been shown to Professor H. H. Rusby, of New York, and recognized by him as the species named.

Professor Lloyd supposing this false senega to be identical with the senega collected in Wisconsin and contiguous States from a supposed variety of *Polygala Senega*, intermediate between the typical form

and the variety *latifolia*, reported his views to the American Pharmaceutical Association in 1881, and exhibited numerous specimens of the root of this supposed variety, all of which were at once declared to differ very essentially in all physical properties from those of the false or white senega, by those who had paid some attention to the latter drug (see *Proceedings, A. P. A.*, 1881, p. 522). In a paper published by Prof. Lloyd in the *Pharmaceutische Rundschau*, 1889, it is stated, p. 88, that he has met with bales of southern senega root of excellent quality, but entirely destitute of the keel. Not having seen this root it is impossible to speak with certainty of its identity with that of white senega; but as figured in the paper quoted (*loc. cit.*, p. 87) it certainly strongly resembles the latter. Recently another paper by Professor Lloyd was published in the *Pharmaceutische Rundschau*, March, 1892, in which it is stated that the "supposed substitution or adulteration, believed to have been observed by Wm. Saunders (1876), J. M. Maisch (1877), etc., were shown to be unimportant or incorrect (unwesentlich oder unzutreffend)," and that this "obviously applies likewise to a senega root received by a New York drug firm, from Kansas, which Prof. Maisch supposed to be derived from *Polygala alba*."

Regarding the first part of this quotation, I may be permitted to reiterate once more what I have repeatedly stated before, that I have never asserted senega root to have been *adulterated* with white senega, since I have seen the latter on the market *only as a substitute* for the former; but on the other hand I have not denied the *possibility* of such intentional adulteration. While recognizing the medicinal utility of white senega root, I do not regard it as equal to that of the officinal senega, and for this reason cannot agree that such substitution is unimportant. Ever since I have first known this white senega root, in 1876, I have held it to be procured from a species differing botanically from *Polygala Senega*, and while I was at one time mistaken as to the identity of the parent plant of white senega, every doubt has, in my opinion, been removed in 1889. Professor Lloyd's assertion of incorrectness in this respect has certainly not been proven by him. *Obviously* this applies in like manner to the second part of the quotation. It is, however, perfectly correct that there was a time when I *supposed* the white senega to be derived from *Polygala alba;* but when this supposition, based upon the characters of a botanical specimen—root with flowering stems

—was verified by the verdict of the botanists mentioned in my former (1889) and the present paper, all of whom had either seen the root or were informed of its dimensions, it would have been more than presumptuous on my part to doubt the identity of the plant.

The main object of Prof. Lloyd's paper is to prove the great scarcity (?) of *Polygala alba*, which he maintains cannot be taken into consideration, either as an accidental or intentional admixture of, or for being mistaken for, senega, and that reference to it in text-books on pharmacognosy should be omitted as not supported by facts (" gegenstandslos "). To these conclusions I most decidedly object as not being warranted by the facts. As to Professor Lloyd's aim to prove that the roots of the two species of *Polygala* cannot be profitably *collected in the same localities*, that point is conceded without reserve; for as far as I am acquainted with the literature on *P. alba*, its true home is farther west and southwest than that of *P. Senega*; and because the former species, as far as known, does not grow in Iowa, Minnesota and Manitoba, efforts made by him to obtain specimens from those localities were, naturally, doomed to be unsuccessful. The root of *P. alba* has thus far come into the market only from southwestern Missouri and from Kansas, and notwithstanding my ill success in former years, living plants could, probably, have been procured more readily in the localities named. When Prof. Lloyd states (*loc. cit.*, p. 52) that he had not found a botanist who had ever met with the living plant, the statement is doubtless intended to refer only to those States in which the true senega is collected for commercial purposes, since Prof. S. M. Tracy, of Mississippi, is quoted as having observed *P. alba* and *P. Senega* never to grow in the same localities, and the former to be scarce even in its most luxurious stations in that State.

Among the botanists corresponded with is also Prof. Thos. Meehan, of Philadelphia, who, it is stated (*loc. cit.*), " being in frequent interchange with botanists and collectors of plants in the different States, endeavored to procure specimens and information concerning the habitat of *P. alba*, but entirely without success." Now, Mr. Meehan is one of the most active members of the Academy of Natural Sciences, and of its Botanical Section, and is very thoroughly acquainted with the Academy's herbarium which contains many specimens of the species named from a number of different

localities; it appeared to me that his inquiries could scarcely have been directed to the home of the plant west of the Mississippi River; and upon inquiry as to the correctness of this supposition he kindly replied as follows: "The statement you quote makes the fact of my not getting the specimens seem more strongly negative than the real facts would warrant. I gave my herbarium away several years ago as that of the Academy of Natural Sciences is convenient, and I am not, therefore, in frequent interchange with botanists; and in regard to this particular case—not knowing that it was a matter of so much importance I did not make the great effort that the remarks would seem to indicate. I had a note from Prof. Cope simply asking if I could get specimens of the plant. I sent to two of my best friends in Alabama and Tennessee and they reported that it was extremely rare, and that they could not get it; but I did not write to friends on the other side of the Mississippi. If I had been asked to make the extra exertion to procure specimens, I would have spent much more time than I thought necessary when the application was made to me."

That Mr. C. G. Lloyd, in exchanging with others, has never been offered *P. alba*, is not an argument in favor of either the rarity or the frequency of the plant; nor is the fact that Prof. Lloyd's correspondence resulted in obtaining specimens from six localities in Mexico, Texas, Kansas, North Dakota and from California, the latter stated to have been procured from the U. S. Agricultural Department. Among the Polypetalæ of the "Flora of California," by W. H. Brewer and Sereno Watson, the species is not mentioned. On this and some other points it was to be presumed that reliable information could be had from the U. S. Department of Agriculture; and in reply to my inquiries, Dr. Geo. Vasey, the accomplished botanist of the Department, furnished the following:

(1) The National Herbarium contains many specimens of *Polygala alba.*

(2) The root seldom attains 5 mm. in diameter, but often grows 30 cm. long. In young plants the root is much slenderer.

(3) The plant is known to occur in Louisiana, Texas, New Mexico, Arizona, Arkansas, Kansas, Nebraska and Dakota. The California locality is probably a mistake.

(4) It is abundant in many places in the Great Plains from New Mexico northward to Dakota.

It is not stated in Prof. Lloyd's paper whether his specimens were accompanied by roots; but it is mentioned that all these *plants* were much smaller than the *Pol. Senega* gathered in Kentucky, and that the North Dakota plants grow only to the height of 5 to 7 inches, and have only small roots. Heretofore I have quoted from the floras of the Northern United States, the Southern United States and the Rocky Mountain Region, showing that the plant attains a height of 12 inches. Still as the height of the stem is no indication of the dimensions of the root, the information kindly given by Dr. Vasey applies more directly to the question at issue. In my paper of Septb., 1889, I give the diameter of the root for the portion beneath the head, *i. e.*, immediately beneath the stem remnants, while Dr. Vasey's measurement, as given above, obviously applies to the body of the root. Comparing the measurements we have:

Length of root: 30 cm. (*Dr. V.*); 4 to 6 inches = 20 — 30 cm. (*M*).

Diameter: 5 mm. (*Dr. V.*); ¼ inch = 6 mm, few roots (in the commercial article) ⅛ inch = 3 mm., some ⅜ inch = 9 mm., rarely ½ inch = 12 mm. (*M.*). These figures speak for themselves.

Referring to the fact that *P. alba* does either not grow, or is very scarce, in the districts where senega is collected, Prof. Lloyd suggests that "possibly it is more frequent in the arid plains of Arizona, New Mexico and in Mexico, but from all appearances even there only in limited tracts." This suggestion is corrected by Dr. Vasey's answer; and as a supplement to it may be quoted Prof. J. M. Coulter's Manual of the Plants of Western Texas, where *Pol. alba* is reported to grow in "sandy soil throughout Texas; apparently the most common *Polygala*."

While in my opinion the facts presented above fully sustain my position in regard to the origin of white or false senega, additional and I think even stronger evidence of its origin from a species differing from *Pol. Senega*, is to be found in the structure of the two roots, as I pointed out in 1877, described briefly in 1881, and illustrated in the National Dispensatory and in my Manual of Organic Materia Medica by sketches drawn from sections of the two roots. These differences may be briefly summed up as follows: The root of *Pol. alba* shows upon transverse section a circular wood surrounded by a bark of uniform thickness, the thin layer of the inner

bark being likewise of uniform width or, in very young roots, absent, because not yet developed. The structure of the root of *Pol. Boykinii* agrees with this description. On the other hand, the transverse section of the root of *P. Senega* always shows a more or less irregular wood, and an irregular development of the inner bark, no two sections of the same root being exactly alike; even in those thick roots in which the meditullium shows apparently a circular growth, it is easily observed, on closer examination, to be of irregular development, most strikingly so in the thinner branches. In other words, in old senega roots grown in rich soil, the irregularity of its structure may become obscured to some extent, but it does not entirely disappear, while no essential change is observed in the uniform structure of young and old roots of *P. alba.*

The conditions pointed out were again observed in a specimen of "northern senega" described by Prof. Sayre in Amer. Jour. Phar., March, 1892, p. 113, and kindly supplied by him. Of the 15 roots of which the sample consisted, seven roots were quite small and immature, weighing together only 3 gm. (46 grains); they are pale colored and show the keel very plainly in all parts. In the remaining eight dark-colored roots some of the thinner portions and of the branches were missing. Four of these roots, weighing 10·4 gm. (160 grains), likewise showed the keel, though less prominently in their upper parts. In two roots, weighing 8·7 gm. (134 grains), mere indications of the keel could be observed in the root body, but the branches showed it distinctly. The remaining two roots, or rather parts of roots, weighed 13·94 gm. (215 grains); the external indications of the keel were quite doubtful, and could not be distinguished from the longitudinal wrinkles of the root due to the shrinkage of the tissues by drying. The internal structure, however, gave abundant evidence of identity with that of the smaller roots. These roots having been collected in the same locality furnish proof that the external restriction and apparent disappearance of the keel can occur only in old senega roots of robust growth. Analogous conditions have never been recorded in the case of the keelless white senega which consists of the naturally thinner roots of Polygala alba.

Nitroglycerin.—Ten drops of a $\frac{1}{100}$ solution have been administered hypodermically in the complete asphyxia of drowning, with marvellous results.—*Quar. Ther. Rev.*, Jan., 1892.

AN EXAMINATION OF SOME OFFICIAL PREPARATIONS.

By Henry Trimble.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy, No. 107.

It has been the custom of the author for several years past to have students in the laboratory examine some of the Pharmacopœial preparations. Last year this work was directed more especially to the inexpensive galenicals which are usually prepared by the pharmacist, although in the following list there are a few that are exclusively purchased from the manufacturer.

Tincture of Iodine.—Robert T. Ward purchased one-half ounce samples from the retail stores of Philadelphia. The Pharmacopœia requires 8 per cent. of iodine. An assay of the samples showed them to vary from 3·08 to 16·15 per cent. Two were above the standard and 23 below. Nearly one-half contained about 6 per cent. The sample containing 16·15 per cent. was dispensed in a 2 drachm homœopathic vial, without a label, and was wrapped in a circular. It was prepared while the customer waited, by pouring an unknown amount of iodine into the bottle and filling up with alcohol. The price charged was 10 cents.

Diluted Acetic Acid.—Frank Miller procured 20 samples from retail stores in Philadelphia. With two exceptions they responded fairly well to the official tests of purity, but in strength of absolute acid they varied from 1·80 to 16·20 per cent. It may be recalled here that the Pharmacopœia requires 6 per cent. Exactly one-half were below the standard. The average was 6·24 per cent.

Sulphurous Acid.—Clinton E. Main experienced much difficulty in obtaining samples of this preparation. He was in most cases asked if he did not want sulphuric acid. One clerk informed him that sulphurous acid was dispensed only on prescription. After visiting many stores where it was not kept, twenty-seven samples were finally obtained.

An assay of each showed them to vary from 0·001 to 4·02 per cent. of sulphurous acid gas. The official contains 3·5 per cent. of the gas. Twenty-six of these samples were below the standard and two-thirds of them contained less than one per cent.

Tincture of Chloride of Iron.—William A. Clingan assayed 14 samples of this preparation, purchased from retail stores. Eleven

of these gave results above the requirements of the Pharmacopœia and three were slightly below.

Water of Ammonia.—John W. Hough examined 20 samples of ammonia water. The results indicate that neither of the official preparations is usually dispensed. Twelve of the samples indicated a strength of about 14 per cent., 5 were no doubt sold as a 10 per cent. solution, and 3 indicated considerable dilution with water, the lowest showed a strength of 4·56 per cent.

Diluted Hydrobromic Acid.—Harry Bitler found this acid to be about the 10 per cent. required by the Pharmacopœia. Of 10 samples examined 3 contained tartaric acid, indicating that they had been prepared by the Fothergill formula. Most of the others contained sulphuric acid.

Hydrochloric Acid.—Alexander B. Petrie, Jr., purchased 25 samples of this acid in Philadelphia and Camden. In every case "strong muriatic acid" was asked for. Nine of the samples were found to be chemically pure, and 16 were the commercial acid. Only one was dispensed in a glass stoppered bottle. The percentage strength of absolute hydrochloric acid was found to vary from 20·9 to 37·8. The Pharmacopœia requires 31·9 per cent.

Solution of Chlorinated Soda.—Harry W. Zeamer assayed 25 samples of this preparation purchased in Philadelphia and Camden. He found 3 of these to contain the 2 per cent. of available chlorine required by the Pharmacopœia. One contained no available chlorine, and most of the remainder contained over one per cent. of the active element.

Diluted Nitric Acid.—G. A. Weston examined 25 samples of this preparation and found the percentage strength to vary from 6·27 to 11·72. Two of the samples contained considerable quantities of hydrochloric acid.

Nitric Acid.—Harry C. Mendenhall found in 20 samples of this acid, that they varied from 50·00 to 72·80 per cent. Only one specimen was dispensed with a glass stopper. None contained more than traces of impurity.

Solution of Chloride of Iron.—Charles H. Raudenbush found 14 samples to yield the required amount of ferric oxide. Nitric acid was found in the majority and oxychloride in one-half the samples. One other specimen, although labelled solution of chloride of iron, was found to be the tincture.

SODIUM BENZOATE.

By Henry F. Kaercher.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy, No. 106.

Read at the Pharmaceutical Meeting, March 15.

This salt is regarded by our Pharmacopœia as crystallizing with a definite amount of water—i. e., one molecule or 11·11 per cent. The result of an investigation by the writer, however, indicates that it contains variable quantities of water, which may be entirely removed at a low temperature.

The first specimen examined was a sample of the salt as found in the market. It corresponded to all the tests of purity. On heating a portion to 200° C., it was found that this temperature was not sufficiently high to decompose it. The amount of moisture obtained by drying to constant weight at 120° C. was 4·59 per cent. Several methods were used to determine whether this dried salt was anhydrous or not—one by igniting and estimating the ash volumetrically as sodium carbonate; the other by estimating the benzoic acid. The latter process was found to give the more accurate results and was accomplished by treating an aqueous solution of the salt with dilute hydrochloric acid, shaking out the precipitated benzoic acid with ether, and allowing the solvent to evaporate spontaneously. The residue on being weighed gave 84·66 per cent. (the theoretical amount in an anhydrous salt being 84·72 per cent.).

The next salt examined was made by granulating at 60° C. Estimation of the moisture gave 18·23 per cent. The same salt crystallized from alcohol, however, gave only 9·01 per cent. (11·11 per cent. being the theoretical amount of one molecule), all of which was removed at 120° C.

An anhydrous salt was obtained by keeping a small quantity of that crystallized from alcohol, in a desiccator over sulphuric acid for several days.

Another sample was made by crystallizing from aqueous solution, displacing adhering water by washing first with alcohol and then with ether, and exposing to the air for a short time. This was found not to be a practical method.

A salt was then made from benzoic acid sublimed from benzoin, by granulating at a moderate heat (below 200° C.). In this prepara-

tion the disagreeable taste of the commercial salt was not noticed. Estimation of the benzoic acid also proved it to be anhydrous.

From this investigation it may be concluded that the commercial salt, as ordinarily prepared by crystallization, is of variable strengths, and that to insure uniformity it should be made anhydrous; also that the benzoic acid sublimed from benzoin gives a much more palatable compound than that made synthetically from toluol.

CALX SULPHURATA AND POTASSA SULPHURATA.

By Wm. G. Kleinstuber, Ph.G.

Abstract from a Thesis.

Calx sulphurata.—The formula of the U. S. Pharmacopœia directs the preparation of sulphurated lime from 100 parts of lime and 90 parts of sulphur; the reaction taking place may be represented by the equation $13CaO + 10S_2 = 8CaS + CaS_5 + 3CaS_2O_3 + CaSO_4$; and if no loss occurs this would account for more than 36 per cent. of calcium sulphide required by the pharmacopœia. A fresh specimen, prepared by the pharmacopœial formula, and five commercial specimens, were examined by the process of the pharmacopœia, boiling 1 gm. with 1·25 gm. of crystallized copper sulphate in 50 cc. of water; in case the filtrate contained copper, its amount was determined by precipitation with KHO, igniting and weighing as CuO. The following results were obtained:

	Found.		CaS
Color of specimens.	CuO	CuS	Per ct.
Grayish white,	—	0·441 gm.	26
Grayish pink,	0·146 gm.	0·302 "	22·76
Grayish,	0·162 "	0·283 "	21·31
Gray,	0·300 "	0·145 "	8·84
Greenish gray,	0·320 "	0·093 "	6·98
Grayish pink,	0·324 "	0·088 "	6·63

Potassa sulphurata.—If the reaction occurring in the pharmacopœial process be expressed by the equation $3K_2CO_3 + 4S_2 = 2K_2S_3 + K_2S_2O_3 + 3CO_2$, the quantity of sulphur directed should be increased from 1 to 1·23 parts.[1] Working by the pharmacopœial

[1] In this calculation no notice is taken of the water and impurities; the U. S. P. requires Potassii carbonas to contain not less than 81 per cent. of K_2CO_3.—Editor.

process, the products, examined immediately, were found to contain less than the required 58 per cent. of sulphide. The results obtained by assaying the recently prepared and five commercial samples of sulphurated potassa are tabulated below; the process used was that of the pharmacopœia: 10 parts (3·23 gm.) of the compound saturated with 12·69 parts (4·069 gm.) of crystallized copper sulphate and 60 parts of water; the copper still present in the filtrate was determined and weighed as CuO.

	Found.		
Color of specimens.	CuO	CuS	Potassium sulphide.
Chocolate-brown, ...	0·02 gm.	1·541 gm.	55·10 per ct.
Orange-green, ...	0·272 "	1·230 "	44·39 "
Green, externally, . . .	0·292 "	1·214 "	43·44 "
Brown, internally, . . .	0·350 "	1·141 "	40·95 "
Greenish yellow, . . .	0·460 "	1·012 "	36·21 "
	0·520 "	0·945 "	33·63 "

NOTE ON SODA MINT.

By F. W. Haussmann, Ph.G.

Read before the Philadelphia College of Pharmacy at the Pharmaceutical Meeting, March 15.

The substitution of spearmint for peppermint water in this popular remedy is of comparatively recent introduction, older formulas for the same almost invariably ordering the latter. Among pharmacists the change has not altogether been approved, as many still follow the custom of the past or the demand of the public for the better known peppermint flavor. The question whether the substitution is preferable, is rather difficult to answer, and either the affirmative or negative rests entirely with the buyer. Peppermint is certainly better known and perhaps more popular with the average consumer, for while perhaps finding a resemblance in spearmint, the more familiar odor and flavor of the former is almost invariably preferred. From a therapeutic standpoint it is also stated to possess greater stimulating properties, but in this case hardly sufficient to have any decided value. On the contrary, as the remedy is often given to infants, the less stimulating action of spearmint water is to be preferred.

A menthol preparation has been suggested, but presents no apparent improvement. Its slight solubility in water is the main disadvantage. This would be chiefly experienced when making the

preparation extemporaneously, which is frequently the case. If the menthol is dissolved in the aromatic spirit of ammonia, and the water containing the soda is added to the solution, separation immediately takes place. A small portion remains, however, in solution, and the agreeable, cooling menthol taste is present.

Considerable difference exists in the various formulas regarding the amount of aromatic spirit of ammonia in the preparation. Some omit it altogether, while others order as much as one ounce to the pint. The National Formulary directs 60 minims to this amount, which, compared to other formulas, is rather weak. Manufacturers of soda mint tablets, in the ammonia strength as well as in the oil selection, follow the old method. Usually each tablet contains, or is stated to contain, 4 grains bicarbonate of sodium, ¼ grain carbonate of ammonium, with ⅙ drop of oil of peppermint. Calculating on this basis, 80 such tablets will furnish the amount of soda in one pint of N. F. soda mint. The amount of carbonate of ammonia (20 grs.) is, however, the one present in one fluidounce U. S. P. aromatic spirit of ammonia, omitting the free water of ammonia altogether. The National Formulary may, perhaps, be improved upon by increasing the amount of aromatic spirit of ammonia to about ½ ounce.

In connection with this subject a few words on the popular *soda mint tablets* may be in order. The presence of carbonate of ammonium has a tendency to decompose or alter the physical condition of the tablets. They become softer and very friable, and sometimes assume a brown color. Free ammonia is developed through the action of the sodium salt on the ammonium carbonate. This may be observed if a bottle, containing a number, is opened, when the ammonia can be detected by its powerful odor or a little HCl on a glass rod. By prolonged exposure to air, the ammonia almost entirely disappears.

The brown color mentioned is probably due to the action of the alkalies upon the oil present. To determine if such was the case, a mixture of commercial oil of peppermint, with a 5 per cent. aqueous potash solution was made, repeatedly agitated and allowed to stand. It separated into two layers, and after several days the potassa layer assumed a brown color. An alcoholic solution of menthol, made to undergo the same treatment, is apparently not influenced in this manner. Perhaps this latter fact may be utilized

in the manufacture of the tablets, to prevent at least the color change. The other decomposition mentioned can hardly be prevented, as long as the volatile ammonium salt forms an ingredient of soda mint tablets.

[*Note by the Editor.*—Among the formulas published many years ago, we find the following:

Sodii bicarb., ʒiv; Spir. ammon. arom., ʒi; Aq. menth. pip., ℥xvi.—G. Norris, in Griffith's Medical Formulary.

Sodii bicarb., ʒij; Spir. ammon. arom., gtt. xl; Aq. menth. pip., ℥viij.—Amer. Jour. Phar., 1869, p. 90, from Ellis' Med. Formulary.

Sodii bicarb., ʒss; Aq. menthæ, ℥iv.—Dr. E. Wilson, in Parrish's Practical Pharmacy, 1859.]

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Creasote pills containing ten or more per cent. of creasote may be made by a modification of Dieterich's method, as follows: Creasote 10 parts, glycerin 1 part, extract of liquorice 10 parts and powdered liquorice root 19 parts.—Gerber, *Schwz. Wochenschr. f. Chem. u. Pharm.*, 1892, 73.

Dermal prescriptions.—Among the remedies prescribed by Dr. Lassar, the following are quite frequently used: *Pasta salicylica* ("white paste"). Salicylic acid 2·0, zinc oxide, starch, of each 24·0, yellow vaselin 50·0. *Unguentum rubrum sulfur.* ("red ointment"). Mercuric sulphide 1·0, sublimed sulphur 25·0, yellow vaselin 74·0, oil of bergamot gtt. xxx. *Unguentum contra Perniones* ("frost ointment"). Carbolic acid 2·0, lead ointment, lanolin, of each 40·0, olive oil, 20 0, oil of lavender gtt. xxv. *Unguentum Diachylon carbolisatum* ("lead ointment"). Lead plaster, yellow vaselin, of each 50 0, carbolic acid 2·0. *Pasta oleosa zinci* ("zinc oil"). Zinc oxide 60 0, olive oil 40 0. *Linimentum picis* ("tar"). Beechwood tar, birchwood tar, of each 40·0, olive oil, dilute alcohol, of each 10·0; this preparation can be diluted with oil. *Pasta Naphtholi* ("scale paste"). β-Naphthol 10·0, precipitated sulphur 50·0, yellow vaselin, green soap, of each 20·0. *Pasta Resorcini mitis* ("mild resorcin paste"). Resorcin 10·0, zinc oxide, starch, of each 25 0, paraffin oil 40·0. *Pasta Resorcini fortior* ("stronger resorcin paste"). Resorcin, zinc oxide, starch, of each 20·0, paraffin oil 40·0. *Pulv. dentifric. sapon.* ("tooth

powder"). Precipitated carbonate of calcium 100·0, potassium chlorate, powdered pumice stone, of each 2·5, medicinal soap 25·0, oil of peppermint 1·0.—*Apotheker Zeitung*, 1892, 105.

Di-iodo-thiophene is proposed by E. Spiegler as a substitute for iodoform; it has been found effective in preventing pus-formations. It has the formula $C_4H_2I_2S$ and contains 75·5 per cent. iodine and 9·5 per cent. sulphur directly in combination with carbon; it forms tabular crystals, easily volatilized, melting point 40·5° C. The odor is stated to be rather aromatic; it is insoluble in water, slightly soluble in cold alcohol, but easily soluble in warm alcohol, ether and chloroform. A ten per cent. gauze is made by saturating gauze with the following solution: Di-iodo-thiophen 50·0, alcohol and ether, of each 500·0, glycerin 10·0; an addition of 2·0–3·0 of a saturated, alcoholic solution of saffranine is recommended to indicate the uniform distribution of the solution upon the gauze.

Sodium thiophene-sulphonate.—$C_4H_3SNaSO_3$ is superior to naphthol in prurigo if applied in the form of a five to ten per cent. ointment (lanolin and vaselin equal parts as the base). This compound is a white crystalline powder containing 33 per cent. sulphur of which one half is directly combined with carbon. The lead salt can be used in the same manner, but it will cause a burning sensation lasting for several minutes with some individuals.—(*Therap. Monatshefte*) *Pharm. Ztg.*, 1892, 106.

Nitrous acid as a disinfectant had been proposed some years ago because of its peculiar property of being an oxidizing as well as a reducing agent; H. Bornträger employs the following combination containing 20 per cent. sodium nitrite: One part sodium nitrite and one part gypsum are melted together, after cooling the mass is powdered and preserved in well-stoppered receptacles. Two parts sodium bisulphate and one part gypsum are also melted together and, after cooling, powdered. Both powders are now mixed and preserved in dry and tightly-stoppered containers. If this powder be thrown into water or substances to be disinfected, a uniform evolution of nitrous acid takes place which rapidly destroys foul odors.—*Pharm. Centralhalle*, 1892, 117.

Kola-nut.—An analysis by Heckel and Schlagdenhauffen was published in the American Journal of Pharmacy, 1884, page 170. It was at first thought that the medicinal effect depended entirely upon the presence of caffeine, although Heckel found that the residue

after extracting with chloroform still had considerable action, and that the red coloring matter by heating gave a sublimate of caffeine which it was thought was prevented from being extracted by some resinous matter. Dr. E. Knebel in taking up this subject finds that the red coloring matter contains a glucoside for which the name *Kolanin* is proposed, and which by heating with water or dilute acid decomposes into caffeine, glucose and Kola-red; it therefore follows that in the above analysis only the free caffeine was determined, whilst that present in combination was put down along with the coloring matter. It is very probable that the unripe or ripe seed contains only the glucoside, which by ripening or drying is decomposed largely into the several constituents by a ferment, which was isolated and found to have diastasic action upon starch; the fresh seed not being obtainable this could not be verified by an examination, but attention is called to the almost molecular proportions in which the caffeine and glucose are found in the dry seed; African explorers have repeatedly stated that the fresh seed upon mastication has at first a bitter taste soon changing to sweet. *Kola-red* free from glucoside was prepared and by analysis was found to have the formula $C_{14}H_{13}(OH)_5$; it is very unstable and very probably by oxidation forms the tannic acid found in the seed.—*Apotheker Ztg.*, 1892, 112.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

Vesication with mercury.—Dr. Aubert (*Lyon méd.* through *L'Union pharmac.*, 1892, p. 55) uses corrosive sublimate as a vesicant with good results. He uses a compress moistened with a 1 per cent. solution of this salt, and in 6 to 7 hours obtains a vesication analogous to that from cantharides. The phlyctæna is limited by the outline of the compress, and judging from the experiment, which should be controlled, the serum is aseptic. The manner of applying is as follows: A layer of diachylon plaster is placed next to the skin, leaving an opening of sufficient size in the centre, on this is applied the compress, following it with oiled silk, cotton and a bandage.

Strontium salts as tænifuges.—Dr. Laborde (*Rép. de Pharm.*, 1892, 85) uses the following prescription in cases of tænia: Stron-

tium lactate 20 gm., distilled water 120 gm., glycerin 30 gm. The dose being two tablespoonfuls a day for five days, at the end of which time the tænia has usually been passed off.

Toxicity of barium salts.—Dr. Bardet (*Société de Thérap.*, December 9, 1891; *Rép. de Pharm.*, 1892, 35) experimented on rabbits with barium chloride. He gave the same by the stomach and by hypodermic injections. The poisonous dose by the stomach amounts to 10 centigm. pro kilogram of animal; they can, however, after some time take 7 cgm. pro ½ kilogm. without inconvenience; hypodermically, these animals resisted doses of 6 cgm. per kilogm. From these experiments the author draws the conclusion that the barium salts are not as poisonous as has been accepted, and that strontium salts which are contaminated by traces of barium salts are unable to produce toxic effects in man.

Toxic effects of boric acid.—Dr. Lemoine (*Monit. Pharm.*, January, 1892, 1019) states that boric acid is not such a harmless antiseptic as has generally been accepted, as it may cause rubeolous eruptions, accompanied by vomiting, constant nausea, intense cephalalgia and sleeplessness without an accompaniment of rise in temperature or acceleration of the pulse. Furthermore, a general urticaria, with vomiting and quiet delirium, were noticed.

Sensitive test paper.—Neutral white filter paper is immersed in tincture of curcuma (1 to 7) and permitted to dry. Each leaf is then treated separately with a 2 per cent. solution of potassium hydrate, and then rapidly washed in pure water. The paper is then dried and preserved in tinfoil; this is necessary as it is altered in contact with air. The sensitiveness of the paper is shown by its coloring in a solution of hydrochloric acid (1–150,000) and also by its change in color in a solution of carbonic acid. The test paper is used in the same manner as litmus paper.—(*Bollet. farm.*, 1891, 721, through *Rép. de Pharm.*, 1892, 28.)

Analysis of commercial starches.—A. Baudry ("*La Pomme de terre industrielle*," through *L'Union Pharm.*, 1892, 63) proposes an analysis based on the following facts: (1) Salicylic and benzoic acids completely dissolve starch on heating; (2) the soluble starch is dextrorotary: (3) the deviation is proportional to the amount of dissolved starch for the same length of tube. The manner of applying this method is the following: 3·321 gm. starch, to be analyzed, is

placed with 80–90 cc. water in a flask of 200 cc. contents. To this is added ·5 gm. salicylic acid, the whole boiled from 20–25 minutes, then sufficient cold water is added to make about 190 cc., and the contents are then cooled. Lastly 1 cc. ammonia is added, the quantity made up to 200 cc., shaken and filtered. The liquid is examined in a 400 mm. tube, giving the amount of anhydrous starch in the sample, if a saccharimeter is used whose 100 division correspond to 10 gm. saccharose (Vivian). If a Laurent saccharimeter is used where the divisions correspond to 16·198 saccharose, only 2·688 gm. of starch are to be employed. In this case the number of degrees observed multiplied by 2 gives the percentage. For determining the quantity of impurities it is only necessary to filter the soluble starch through two equipoised filters, one placed within the other, and then washing the residue with boiling water until the filtrate gives no reaction with ferric chloride. The filters are then dried and weighed.

Santoninoxime as an anthelmintic is recommended by Coppola (*Union méd.*) who regards it as a safe and reliable substitute for santonin, requiring doses about three times as large as those of the latter, the administration, however, not being followed by unpleasant effects.

Santoninoxime, $C_{15}H_{19}NO_3$, was first prepared in 1889, by P. Guici (*Gazz. chim.* xix, 367) by digesting near 80° C, for 3 or 4 days 5 p. santonin, 4 p. hydroxylamine hydrochloride, 50 p. strong alcohol and 4 p. precipitated calcium carbonate. It crystallizes in white silky needles, melts at about 217° C., is very slightly soluble in hot water, and turns polarized light to the left, $[\alpha]_D = -80{\cdot}83$.

Ephedra vulgaris is esteemed in Russia as a popular anti-rheumatic remedy. Dr. Betchine of St. Petersburg (*Lyon médicale*) has found the bark and the root quite efficacious in acute articular rheumatism with high fever, but in chronic rheumatism not accompanied by fever only temporary relief could be observed. See also Am. Jour. Phar., 1884, p. 540; 1890, pp. 339, 397.

Value of Cinchonas cultivated at Reunion.—The French government has been making experiments with the cultivation of cinchonas at Reunion. Analyses of these barks made by Houdas show that they contain but 4·32 per cent. of total alkaloids, 1·70 per cent. being quinine.—*Rép. de Pharm.* 1892, 90.

Assay of Coffee.—According to Herlant (*Monit. de la Pharm.*, Feb. 1892, 1028), the caffeine can be estimated in coffee, as follows: The finely powdered coffee is mixed with slaked lime, and this mixture extracted with a 5 per cent. solution of sodium benzoate which dissolves the caffeine. The liquid is made alkaline with sodium carbonate and filtered. The filtrate is then extracted with a sufficient quantity of chloroform, which on evaporation yields the caffeine in the form of white silky crystals.

Natural oil of bitter almond.—For distinguishing an artificial from a natural oil it is proposed by Wender to heat the oil with 1 cc. of a mixture of equal parts of alcohol and sulphuric acid and two drops of an aqueous solution (½ per cent.) of furfurol. The natural oil gives a brownish violet color increasing in intensity for 24 hours. The artificial oil assumes a rose color, gradually changing to pure violet. Unfortunately mixtures of the two oils cannot be distinguished by this reaction.—*Boll. farm.*, Nov, 1891, 680, through *Journ. de Pharm. d'Anvers*, 1892, 23.

Erythrophlœine.—The alkaloid of Erythrophlœum guineense, according to Prof. Sée, (*La Méd. moderne*), is about as poisonous as the amorphous digitalin of Homolle and Quevenne, and acts both upon the heart and lungs. The hydrochloride crystallizes and is soluble in water. The medicinal dose, 1·5 to 2·5 mgm. ($\frac{1}{40}$ to $\frac{1}{25}$ grain), does not produce any digestive disturbance, and modifies but slightly the condition of the heart, but renders respiration more easy.

Camphorated Salol has been used with favorable results by Dr. Pégon (*Rev. Thérap.*) in suppuration of the ear. It is prepared by fusing at a moderate heat equal parts of salol and camphor, filtering if necessary, and preserving the product in a yellow well-stoppered glass bottle. At ordinary temperatures it forms a thick colorless liquid, which is decomposed on exposure to light or air, is insoluble in water, but dissolves in ether, chloroform or oil. It is applied by means of a small pledget of cotton. See also Amer. Jour. Phar., 1889, p. 136, and 1891, p. 54.

Decomposition of iodoform in collodion.—Etiévant ascertained (*Rép. de Phar.*, Jan. 10, 1892) that 50 gm. of a freshly prepared 10 per cent. solution of iodoform in collodion, exposed to the sunlight, after 24 hours may contain 0·40 gm. free iodine, while the amount

of iodine liberated in the dark was only 0·06 gm. The decomposition is retarded by keeping the solution in yellow glass bottles, which are preferable to blue glass. The decomposition is increased by a rise of temperature. In neutral solutions the decomposition of iodoform is very slight, but it is hastened on by the addition of acids. In making *iodoform collodion* it is, therefore, important that the vehicle be of neutral reaction, and that the preparation be kept in well-stoppered yellow glass bottles, in a cool place, and exposed to the light as little as possible.

Guaiacol biniodide, a new aristol.—Dr. Vicario (*Prog. Thérap.*, January, 1892) proposes guaiacol biniodide as a probable pulmonary antiseptic. It is prepared from guaiacol sodium by the action of iodine in potassium iodide solution. The guaiacol is treated with an excess of caustic soda, which produces a whitish mass gradually becoming greenish and violet. The guaiacol sodium is obtained in a pure and crystalline state by recrystallization from guaiacol. The guaiacol can be recovered by distillation. The crystalline compound is dissolved in water and to this is added a solution of iodine in potassium iodide as long as precipitation takes place. The precipitate is of a reddish brown color possessing the odor of iodine, readily decomposable on heating, fusible on a water bath and soluble in alcohol and fixed oils.

Valuation of creasote.—E. Merklen (*L'Union pharm.*, 1892, 5) gives easily applied tests for the valuation of beech wood creasote. (1) *Water*, of which it can take up 9 per cent. Ten cc. creasote are heated with about 2 gm. calcium chloride in a test tube until the salt melts. The two are then well mixed and set aside to cool. In case water is present the calcium chloride remains liquid. Anhydrous copper sulphate could be used for the same purpose, the white salt becoming blue in presence of water. (2) *Phenol.* The well-known tests of collodion and perchloride of iron are of no use in case a mixture of phenol and creasote is to be examined. The best test is that proposed by Flückiger. Four cc. creasote and 1 cc. ammonia are heated to 60° C. (150° F.), well mixed and poured into a large capsule. This is then tilted from side to side so as to make the liquid cover as large a surface as possible. A small vial of bromine is then inclined toward the centre of the capsule, so that the vapor can readily come in contact with the liquid. Where

the vapor of bromine acts on phenol or carbolic acid a deep blue color appears in place of the brown color turning to green, which is due to pure creasote. (3) *Guaiacol.* Although it is not proven that guaiacol is the only remedial agent contained in beech wood creasote, it is present in large quantity and should only traces be found, it can easily be supposed that the guaiacol has been separated. In mixing 5 cc. creasote with 50 cc. of a 20 per cent. alcoholic solution of potassium hydrate, the liquid assumes, in from ten to thirty minutes, a crystalline state due to a combination of creasol and guaiacol with potassium. The crystalline mass is pressed between filter paper until perfectly dry and put into a test tube with 5 cc. sulphuric acid diluted to 1–10. The mixture is heated for a moment when the creasol and guaiacol rise to the top of the liquid. The aqueous liquid is then sufficiently diluted to allow the oils to sink to the bottom when it is decanted, and is replaced by 4 cc. of concentrated ammonia. This forms a hard crystalline compound with guaiacol while the creasol after some time forms a semi-solid crystalline mass. On treating the mass with benzin everything goes into solution but the ammonia compound of guaiacol.

Creasote should have a specific gravity of 1·080, should remain limpid with dilute sodium hydrate and should not redden blue litmus paper.

Synthetic paracresylol is recommended by Choay (*Rép. de Phar.* Jan. 10, 1892) in place of the numerous compounds and mixtures of impure cresylols which have recently been introduced. It is insoluble in water, but dissolves in alcohol, glycerin, and in soap solutions. One part of soap will form with 2 parts of paracresylol a perfect solution in water. Such solutions are neutral and contain the active agent in the free state, so that it may be completely removed by agitation with ether.

ITALIAN YELLOW WAXES.[1]

By Stefano Camilla.

The investigation was conducted in the laboratory of Prof. Guareschi, at Turin. After detailing the recorded results of others in the analysis and the examination of beeswax, the author describes

[1] Sulla cera gialla delle api. Contributo allo studio della cera gialla italiana. Tesi de Laurea in Chimica e Farmacia.—Abstract prepared by Jos. W. England, Ph.G.

his own investigations which were made with eleven samples of wax from different parts of Italy.

The specific gravities were determined with the picnometer of Unger[1], and the results corrected to temperature at + 4°. One specimen gave 0·966, and another 0·964, while the remaining nine ranged from 0·959–0·961. Dieterich and Rüdorf have found the specific gravity of yellow wax to be 0·973. The present German Pharmacopœia gives 0·962–0·966; the preceding edition 0·955–0·966; the Russian Pharmacopœia 0·960, the Danish 0·960–0·970, and the Netherland as 0·968–0·970. The author claims that the Unger picnometer is much superior to the older method of using an alcoholic and ammoniacal solution.

The melting points in the Italian waxes varied from 62·5° to 63·5°, and from 63·3° to 64·4°. The point of solidification was from 0·5° to 1° less than the point of fusion. The fusing point is stated by the German Pharmacopœia to be from 63°–64°; by Schödler, 62°–62·5°; by Payen, 61·5°–62°; by the British Pharmacopœia, 60°; by the Austrian and Netherland, 60°–62°; by the Danish, 62°; by the Russian 62°–63°; by the Swiss, 62°–64° and by the Hungarian Pharmacopœia, 68°.

The acid numbers[2] were next determined by ascertaining the number of milligrams of KHO required to neutralize the free acids in one gram of the wax, of which the more important is cerotic acid; they are soluble in boiling alcohol. The following method was used: Introduce 2 to 4 grams of the wax into an Erlenmeyer flask with 30 cc. of alcohol (95 per cent.), slowly bring the contents to the boiling point, agitating briskly. To the alcoholic solution of the free acids a few drops of one per cent. alcoholic phenolphthaleïn solution are added as indicator, and a half normal alcoholic solution of KOH is used for estimation. According to Hehner, each milligram of KOH corresponds to 7·308 milligrams of cerotic acid. The data of Hübl show that for the saturation of the free acids in one gram of wax, there was required 19–21 mgm. of KOH. Hehner has found that English wax requires 20 mgm., Buisine placed it at 19–21 mgm., Mangold at 20 mgm.; in the Italian waxes, examined

[1] Beckurts' Jahresbericht, 1888, p. 145.

[2] For acid, ether and saponification numbers, see Amer. Jour. Phar., 1884, p. 480, and 1888, p. 561.

by the author, the greater number run from 19·04 to 20·03; those from Liguria from 20·67 to 21·22.

The ether number is represented by the milligrams of KOH required for the saturation of the acids present in combination in 1 gram of wax. The main acid is palmitic, combined with melissic alcohol, constituting myricin. For the determination of the ether number the mixture left from the previous acid determination is heated to boiling with 30 cc. of alcohol (95 per cent.) and 10 cc. of a normal alcoholic potash solution; and when saponification is complete, estimate excess of alkali with a half-normal solution of HCl; the difference for one gram of wax will give the ether number, which varies in the Italian waxes examined between 72·18 and 76·05. The ratio of acid and ether numbers is, therefore, 3·55 to 3·8; Hübl determined it between 3·6 and 3·8; Mangold between 2·89 and 4·02, and Buisine, 3·5 to 3·8. The total of KOH used for the free and combined acids gives the saponification number, which varies for the Italian waxes between 91·22 and 97·27 (to 96 for the greater number), while Becker found 97 to 107, Hübl 92 to 97, Buisine 91 to 97, and Mangold 88·26 to 99·9, in many cases less than 93.

In the estimation of the volatile acids, Reichert's method modified by Meissl was used as follows: Saponify 5 gm. of the wax with 1 gm. of KOH and 50 cc. of the purest alcohol; distil off the alcohol when reaction is complete, dissolve the residue in 100 cc. of distilled water, add 20 cc. of dilute sulphuric acid (1 : 10), and several pieces of pumice stone to facilitate ebullition, collect 100 cc. of distillate, and titrate this with $\frac{1}{10}$ normal soda. The number of cubic centimeters necessary for neutralization is the Meissl number, which, in the specimens examined, varied from 0·35–0·40; for two samples from Liguria it was 0·54 and 0 91.

The iodine number is the quantity of iodine absorbed by 100 grams of wax. The author does not agree with A. and P. Buisine that the iodine absorbed is due entirely to the presence of oleic acid and other non-saturated acids of the series $C_nH_{2n-2}O_2$, but he claims that a part of the iodine must go to the unsaturated hydrocarbons in the wax, which amount to about 2·86 per cent., and must also be influenced by the coloring and odorous matters present, and for these reasons he questions the value of the iodine number as an indication of the amount of oleic acid. A number of Italian waxes examined by the method of Hübl, showed the iodine number to

vary with the intensity of color. In white wax it was from 2 to 7; and in yellow wax from 8·18 to 11·06.

As possible adulterants are mentioned paraffin, Chinese wax, Japan wax, ozokerite, ceresin, vegetable waxes, carnauba wax, stearic acid, suet, resin, mineral and organic matter. Several specimens of adulterated wax were examined by the author; and for comparison with the results obtained with pure wax, Hübl's table of results with wax substitutes is quoted (see Amer. Jour. Phar., 1884, p. 480); also the results obtained at the central chemical laboratory of Rome in 1890, which are, in part, given in the annexed table:

	Fusing point.	Acid Numbers.			Iodine number.
		Acids soluble in water.	Free acids.	Total acids. (Saponification.)	
Japan wax,	47–54	2	18–28	216–222	6·7·55
China wax,	53·5	2	22	218	6·85
Vegetable wax,	47–54	2	17–19	218–220	6·6–8·2
Carnauba wax,	83–84	0	4–6	79–82	7–9
Mineral wax,	60–80	0	0	0	0·06
Paraffin,	38–74	0	0	0	1·7–3·1
Grease wax,	62–66	0	95–115	102–119	13–18·5
Suet,	42–50·5	0	2·75–5	196–213	27–40
Stearic acid,	55·5	0	204	209	4
Resin,	—	0	168	178	135·6
Yellow beeswax,	62–64	0–1	19–21	91–97	8–11
Bleached beeswax,	63–64	0–2	20–23	93–111	2–7

UNNA'S MEDICATED SKIN VARNISHES.

Skin varnish is the term applied by Unna to preparations used in dermatological practice for forming a thin covering on the skin. The principal bases for these preparations are the following:

Bassorin Varnish.—The pure bassorin basis is obtained, according to Elliot, by filtering tragacanth mucilage (15: 100) in a filter heated by steam, evaporating and mixing with glycerin. A similar basis may be prepared by stirring five parts powdered salep with 95 parts cold water until a smooth mucilage is obtained, then heating for

half an hour on the steam-bath. The salep basis contains less bassorin but more starch.

Casein Varnish.—The casein obtained by coagulating skim-milk with rennet at a temperature of 35° to 40°, is washed and dried until it forms a yellowish-white sandy powder soluble in alkaline solutions. In preparing the casein varnish this casein is dissolved by means of borax. For 20 parts casein, 2·5 parts of borax and 77·5 parts water furnish a rapidly drying uniform covering material. The alkaline characters of the borax are marked by the casein. Admixtures of heavy pulverulent substances readily settle out of this basis and it is requisite to distribute them by shaking. A varnish of casein and glycerin is prepared by dissolving the casein in 3 or 3·5 parts of ammonia, adding a quantity of glycerin equal in weight to the casein, and heating to drive off the ammonia. The resulting mass mixed with twice its weight of boiling water gives an excellent permanent emulsion.

Amber Varnish is made by dissolving a mixture of amber and turpentine in alcohol. It must not be used as a vehicle for the application of zinc oxide.

Castor Oil and Shellac Varnish.—With 1 part shellac, $\frac{1}{5}$ part castor oil, and 3 parts alcohol, a varnish is obtained which forms a good flexible covering easily removed by alcohol.

Canada Balsam and Collodion Varnish.—Sixteen parts collodion with 1 part Canada balsam gives a material suitable for the application of pyrogallol, and it can be easily removed by alcohol.

Castor Oil and Collodion Varnish.—Eight parts collodion and 1 part castor oil.

Lead Ricinoleate Varnish.—One part lead oxide heated with 1 5 part castor oil to saponification and mixed with 2 parts absolute alcohol, gives a good skin varnish.

Chrysarobin Amber Varnish.—One part chrysarobin and 20 parts of amber dissolved in turpentine.

Pyrogallol Shellac Varnish.—One part pyrogallol, 1 part castor-oil, 5 parts shellac and 15 parts absolute alcohol.

Salicylic Acid, Canada Balsam, and Collodion Varnish.—One part Canada balsam, 10 parts collodion and 3 parts salicylic acid.

Zinc Oxide, Castor Oil, and Collodion Varnish.—Two parts zinc oxide, 2 parts castor oil and 16 parts collodion.

Zinc and Lead Ricinoleate Varnish.—Five parts lead ricinoleate,

8 parts zinc oxide, 8 parts absolute alcohol, and lastly 1 part each of collodion and ether.

Ichthyol Borax Casein Varnish.—Five parts sodium ichthyolate and 15 parts borax casein varnish.

Sulphur Glycerin Casein Varnish.—Five parts sulphur and 15 parts glycerin and casein varnish.

Zinc Oxide Salepbassorin Varnish.—Two parts zinc oxide and 18 parts salepbassorin varnish.

Zinc Ichthyol Tragacanth Bassorin Varnish.—One part sodium ichthyolate, 2 parts zinc oxide, and 17 parts tragacanth bassorin varnish.—*Therapeut. Monatsch.*; *Phar. Jour. and Trans.*, March 5, 1892, p. 733.

COAGULATION OF THE BLOOD.[1]

By C. A. Pekelharing.

Recently, a number of observations on the importance of calcium salts in the process of blood coagulation have been published.

Brücke first showed that the ash of fibrin always contains calcium. In 1875, Hammarsten found that calcium chloride can take the place of serum globulin in fibrin formation. In 1887, Green found that in magnesium sulphate plasma, and also in other forms of plasma, coagulation is hastened if small quantities of calcium sulphate are added in addition to fibrin ferment. Later, Ringer and Sainsbury found that this result can be brought about by other calcium salts, such as the chloride, and also, but not so readily, by means of soluble strontium and barium salts. Freund (*Med. Jahrb.*, 1888, 259) who also noted the hastening of coagulation by calcium salts, considered that the blood corpuscles, as soon as the blood is shed, yield alkaline phosphates to the plasma; meeting with the calcium salts there, tricalcium phosphate is precipitated, and herein lies the cause of fibrin formation. Latschenberger (*Med. Jahrb.*, 1888, 479), and von Strauch (*Dissert. Dorpat*, 1889) showed certain fallacies in this hypothesis; thus the addition of alkaline phosphates and calcium salts resulting in the precipitation of tricalcium phosphate does not always lead to the formation of fibrin in fibrinogenous liquids; also the first portions of fibrin formed were found

[1] *Virchow's Festschrift*, 1891, Bd. 1; Jour. Chem. Soc., 1892, p. 87.

to contain calcium, but no phosphoric acid, and further, in the present research, it is shown that injection of disodium phosphate into the circulation of a living animal is not followed by thrombosis.

Arthus and Pagés (*Arch. de Physiol.*, 1890, No. 4) found that blood coagulation may be entirely prevented if, immediately on being shed, the blood is mixed with small quantities of substances, like oxalates or fluorides, which precipitate calcium salts as very insoluble compounds. On adding to the plasma obtained from this blood a slight excess of calcium chloride, coagulation immediately ensues. Fibrin ferment is, however, essential for the process; and the action of this agent is considered to be the bringing together of fibrinogen and the calcium compound, and thus the formation of fibrin. In this, they draw a close analogy between fibrin formation and the formation of casein in milk under the influence of the rennet ferment. Green attempted to answer the question: Does the fibrin ferment exist as zymogene in the plasma, and is such zymogene converted into the ferment by the action of the calcium salt? He was unable to find a positive answer; and therefore considered that the calcium acts in assisting the ferment much as hydrochloric acid in the gastric juice favors the activity of pepsin. This question is again taken up in the present investigation, and it was found possible to prepare from plasma (such as oxalate plasma which contains no ferment) a globulin which has no fibrinoplastic properties, which, however, after contact with calcium chloride, is converted into the ferment. The zymogene yields an ash containing little or no calcium, whilst the ferment is rich in calcium. The material in question arises from the formed elements of the blood, and is identical with what is called cell-globulin by Halliburton.

Fibrin, moreover, is a calcium compound, and the main action of the ferment appears to be to transfer the calcium to the fibrinogen.

Granting this hypothesis, it is possible to explain several facts hitherto but little understood in connection with blood coagulation, and to reconcile certain conflicting theories. The action of oxalates in hindering coagulation is explained on the supposition that the precipitate of calcium oxalate, on account of its insolubility, is not available for the conversion of zymogene into ferment. The action of neutral salts in restraining clotting is explained on the assumption that the ferment is a globulin, and although the amount of salt

added is not sufficient to precipitate the globulin, yet it is sufficient to lessen those intramolecular movements which, in the end, produce its specific action.

The action of peptone in hindering coagulation can be explained by the affinity between peptone and calcium compounds. It thus prevents these from converting the zymogene into the ferment. This view is supported by the fact that other substances, like soaps, which combine with calcium compounds, produce similar symptoms to those set up by peptone (Munk). Thus, there is a loss of coagulability of the blood, low blood pressure, suppression of secretions, and even death. The toxic effects appear to be due to the removal of calcium salts, which are necessary, as Ringer has shown, for all vital processes. A further support to the theory is obtained from the fact that injection into the circulation of calcium chloride simultaneously with the peptone, or after the peptone, obviates the poisonous effects of the latter; peptone is then no longer capable of rendering the blood uncoagulable. Peptone also restrains coagulation in intravascular plasma (or solutions of Hammarsten's fibrinogen), provided that it is added so rapidly that the zymogene has not had time to combine with the calcium to form the ferment. After the ferment has been once formed in the plasma, or added to the solution of fibrinogen, peptone has no longer any hindering influence on coagulation.

Wooldridge's tissue fibrinogens appear to consist of proteid nuclein and lecithin. They contain no fibrin ferment until they have been digested for some time with a little calcium chloride; it is, therefore, considered that they contain the zymogene of fibrin ferment, and their action in producing intravascular coagulation is explicable on the theory that, in the blood, they come into contact with calcium compounds, so that the zymogene is then converted into the ferment.

ARTIFICIAL HUMAN MILK.

By T. Maltby Clague, Pharmaceutical Chemist.

During the last four years experiments have been made at intervals, the record of which will be of sufficient interest to pharmacists to warrant publication.

Attention was first given to the subject through the request of a medical practitioner, who desired to obtain a supply of food for

young infants which should as nearly as practicable resemble the mother's supply, when that supply was deficient or absent.

The literature on the subject was principally found in an article by Professor Frankland ("Experimental Researches," London, 1877, p. 843). Here the percentage composition of human and cow's milk was given as follows:

TABLE I.

	Woman.	*Cow.*
Casein,	2·7	4·2
Butter,	3·5	3·8
Milk-sugar,	5·0	3·8
Salts,	·2	·7

A glance at this table will show that the assimilation of the two required that the quantity of casein present in cow's milk should be decreased, while the quantity of butter was maintained, and that of milk-sugar should be increased.

In the case of the addition of milk-sugar the increase was easy, as a supply of that constituent was easily obtained to augment that which was already in the natural compound. But the subtraction of the casein was not so simple a matter. He proposed, however, to accomplish this, to remove one-third of the casein from cow's milk, and to keep the butter strength as it was, thus giving a liquid having a composition per cent. of:

TABLE II.

	Per Cent.
Casein,	2·8
Butter,	3·8
Milk-sugar,	5·0
Salts,	·7

The mode of preparation was to remove the cream from one-third of a pint of new milk and by means of rennet to curdle the skimmed milk; the separated whey had then 110 grains of milk-sugar dissolved in it, the solution being added to the remaining two-thirds of a pint of new milk and the cream which had been removed as above.

Although very good results could be obtained by this process, it had the disadvantage of being wasteful and tedious. A simpler mode of working was therefore thought out and the following plan was adopted.

Water was used in the place of the whey, and extra cream sepa-

rately purchased was used to supply the required extra butter. Milk-sugar was separately added, the working formula being:

TABLE III.

	Oz.
New milk,	30
Cream,	1¾
Milk-sugar,	1⅛
Water,	18

Fortunately, a large and well managed dairy in the neighborhood supplied a cream which repeated analysis showed to be very uniform in composition, and so made it an easy matter to build up a product which should approximate very closely to its theoretical contents:

TABLE IV.

Casein,	2·7
Butter,	3·8
Milk-sugar,	5·0
Salts,	·4

A comparison of the last table with the first will show that results are obtained more closely in accord with the human milk than by the mode advocated by Professor Frankland, while the process is simpler and more economical.

The prominence given in recent years to the supremely important question of sterilization was next taken into account; the object being to avoid the possibility of communicating disease, and also to present the food free from germs of decomposition, which might be developed after its ingestion and cause dyspepsia.

The method advocated by Professor Soxhlet, and published in the *Pharmaceutical Journal*, 3d series, vol. xvii, p. 573, was adopted with slight modifications. The expense of rubber corks stood in the way of their use, but ordinary corks presented many difficulties in the obtaining of a perfect hermetical sealing. Chief among these difficulties was the fact that cork compressed while hot and wet into the neck of a bottle, did not retain its elasticity sufficiently to remain air-tight. It was found feasible to produce results which would remain good for a week or so; it was much more difficult to secure its keeping for longer periods. Samples have, however, been manipulated, which remained sweet and good for over two years.

Several children were put upon this food, as made in our laboratory, and the results were of a most satisfactory character: the tes-

timony of parents and medical attendants being that the children were able to retain and assimilate the food, who could not retain or assimilate any other milk food; while the development of the children was steady and gratifying. The profit obtainable was not, however, sufficient to compensate for the trouble involved, and a simple receipt for its manufacture was given to several parents, who have been able, with the implements and intelligence contained in their kitchens, to produce satisfactory results. This was: New milk, 3 pints; cream, 4 ounces; milk-sugar, 3¼ ounces; water, 2 pints. Dissolve the milk-sugar in the water and mix all together. Put into bottles filled to shoulder only, place them on the tray of a fish kettle, surround with water and place on the fire. Allow the water to boil for half an hour, so that the expansion of the milk may be fairly complete; then cork and allow the boiling to continue for another half-hour, when the operation is complete.

A sample of the kitchen-prepared article has been submitted to analysis with the following results:

Casein,	2·6
Butter,	3·4
Milk-sugar,	4·8
Ash,	·4
Water,	88·1

A comparison of the digestibility of the three milks, that is the artificial human, the natural supply and cow's milk, has also been attempted. A sample of each was submitted to the action of rennet. In the case of the cow's milk the curd consisted of one large clot, while in the other two it was much broken up. To each a few minims of acid glycerin of pepsin was added, and they were placed in a water-bath at 140° F. for half an hour. Solution was almost complete in the case of the human and the artificial, while the cow's milk was far behind in the apparent solution.—Phar. Jour. and Trans, Feb. 13, 1892, p. 651. See also paper on the same subject by Geo. Smith, F.C.S., in Amer. Jour. Phar., 1889, page 424.

Large dose of paraldehyde.—Dr. Mackenzie (*Brit. Med. Jour.*, Dec. 12, 1891) reports the case of a lady patient who took by mistake 3½ oz. paraldehyde. She became unconscious; after thirty hours showed signs of returning consciousness; after 34 hours opened her eyes; after 41 hours could understand and reply to a simple question. Strychnine and ammonia, also Faradic electricity were used as remedies.

ON THE ALKALOIDS OF TRUE ACONITUM NAPELLUS.[1]

By Professor Dunstan and Mr. John C. Umney.

From the Research Laboratory of the Pharmaceutical Society.

The authors have examined the alkaloidal constituents contained in the roots of the true *Aconitum Napellus*. The plants were grown by Mr. E. M. Holmes, at the instance of the British Pharmaceutical Conference. The process used for the extraction of the alkaloids was such as to preclude the possibility of the occurrence of hydrolysis or other decomposition of the alkaloids. It consisted in percolating the roots, dried at a low temperature and finely powdered, with cold rectified fusel oil (b. p. 100°–132°) and extracting the alkaloids from the solution by agitation with water acidified with one per cent. of sulphuric acid. Resin was removed by extracting the acid solution with chloroform, and the liquid was then made just alkaline with dilute ammonia and extracted with ether, which removed a considerable quantity of alkaloid but left in solution a further and smaller quantity, which was subsequently dissolved out by agitation with chloroform.

The *alkaloid soluble in ether* was obtained as a gum-like mass incapable of crystallization. By conversion into hydrobromide it was separated into a crystallizable and uncrystallizable salt.

The crystalline hydrobromide was identified as the salt of aconitine, the crystalline and highly toxic alkaloid already described by one of the authors and Dr. W. H. Ince. The rotatory power of the pure hydrobromide in aqueous solution was ascertained to be $[\alpha]_D$ — 29·65, a result which agrees well with that recorded in the paper above referred to. As some doubt exists with reference to the solubility of aconitine in water, it was carefully determined with this pure specimen. The mean of two determinations was 1 gramme in 4,431 grammes of water at 22°. Jürgens had previously recorded the far greater solubility of 1 in 745 at the same temperature.

The non-crystalline hydrobromide furnished an alkaloid resembling a gum in appearance. It dissolved in ether and alcohol, but only sparingly in water. The aqueous solution was alkaline to litmus and was very bitter, but it did not give rise to the tingling

[1] The substance of a paper communicated to the Chemical Society, on March 3, 1892; reprinted from Phar. Jour. and Trans., March 5, p. 729.

sensation so characteristic of aconitine. The base could not be crystallized, neither could the hydrochloride, sulphate and nitrate prepared from it. The aurochloride is also amorphous. Owing to the circumstance that a crystalline compound of this base could not be obtained, it was difficult to gain conclusive evidence of its homogeneity.

The properties recorded above show that it is not aconine or the base called by Wright and Luff picra-aconitine, which readily afforded crystalline salts. These characteristic properties belong to an alkaloid of which a full account will be given in a later paper, considerable progress having already been made in the most difficult task of isolating it in a pure state. We propose to assign to it the name of *napelline*, which was first given to the alkaloid now known as pseudaconitine, and afterwards by Hübschmann to a substance which the work of Wright and Luff showed to be a mixture chiefly composed of aconine. The napelline obtained as described above is probably associated with another amorphous base, about which we have at present little information to give, beyond the fact that neither it nor its salts appear to crystallize.

The *alkaloid soluble in chloroform* was proved to be identical with *aconine*, the amorphous base which results from the hydrolysis of aconitine. On combustion it afforded numbers corresponding with those deduced from the formula $C_{26}H_{41}NO_{11}$. Its molecular weight determined by Raoult's method also corresponded with this formula.

The roots of the true *Aconitum Napellus* certainly contain three alkaloids, one of which is crystalline, viz.: aconitine; two being amorphous, viz.: napelline and aconine. Indications have been obtained of the presence of a fourth alkaloid which is amorphous and closely resembles napelline.

The authors found that the juice expressed from the roots contained a large proportion of amorphous bases but very little aconitine, the greater part of which remains in the root and may be extracted, together with the remainder of the amorphous alkaloids, by exhausting with amyl alcohol. The total quantity of amorphous bases amounted to more than twice that of aconitine.

The physiological action of all these alkaloids is being investigated. The results so far obtained point to the conclusion that crystalline aconitine is by far the most toxic of the alkaloids contained in *Aconitum Napellus*.

ON THE FORMATION AND PROPERTIES OF ACONINE AND ITS CONVERSION INTO ACONITINE.[1]

By Professor Dunstan and Dr. F. W. Passmore.

From the Research Laboratory of the Pharmaceutical Society.

Owing to the uncertainty which exists with reference to the products of the hydrolysis of aconitine, the authors have investigated the subject, starting with a pure alkaloid. Wright and Luff have stated that when aconitine undergoes hydrolysis the sole products are aconine and benzoic acid. More recently Dragendorff and Jürgens have asserted that the hydrolysis occurs in two stages. In the first stage there are formed benzoic acid and an alkaloid identical with the picraconitine once isolated by Wright and Luff from the roots of supposed *Aconitum Napellus*. In the second stage the picraconitine is hydrolyzed into benzoic acid, methyl alcohol and aconine, which is the final product of the change.

The authors have carefully studied the process of hydrolysis by heating pure aconitine with water in closed tubes at 150°, but have been unable to obtain at any stage either picraconitine or methyl alcohol. The alkaloid extracted from the solution by ether was a mixture of aconine with unaltered aconitine. With pure aconitine the reaction occurs precisely in accordance with the equation $C_{33}H_{45}NO_{12}+H_2O=C_{26}H_{41}NO_{11}+C_7H_6O_2$

Having accumulated in these experiments a few grains of aconine, the authors proceeded to examine its properties when in a pure state. Up to the present time neither it nor its salts have been obtained in a crystalline state. The base, even when quite pure, cannot apparently be crystallized; all attempts to induce crystallization having failed. The authors have, however, succeeded in crystallizing several of the salts, viz.: the hydrochloride, hydrobromide, sulphate and nitrate. All these salts are very soluble in water; the hydrochloride being the least soluble is the easiest to crystallize. This salt is best purified by crystallization from a mixture of alcohol and ether. When dried at 100° it melts at 175·5° (corr.). The crystals deposited from alcohol have the composition $C_{26}H_{41}NO_{11},HCl,2H_2O$. When dried at 100°, they still retain 1 H_2O, which is, however, lost at 120°. The aqueous solution is lævo-

[1] The substance of a paper communicated to the Chemical Society on March 3, 1892; reprinted from Phar. Jour. and Trans., March 5, p. 729.

rotatory $[\alpha]_D$—7·71°. The base was obtained from the pure hydrochloride by decomposition with a solution of silver sulphate, and decomposition of the aconine sulphate, with exactly sufficient baryta water. The solution on evaporation furnished a hygroscopic, brittle gum, which refused to crystallize. It melts at 132° (corr.). Aconine is very soluble in water, and the aqueous solution is alkaline. When dry it is insoluble in ether and almost insoluble in chloroform. On analysis it afforded numbers agreeing with the formula $C_{26}H_{41}NO_{11}$, which is that suggested by Dunstan and Ince as a result of their study of pure aconitine. Aconine is a powerful reducing agent, precipitating the metals from solutions of gold and silver salts. It also reduces Fehling's solution. By the reaction of auric chloride with a solution of aconine hydrochloride, an amorphous aurochloride is obtained which is considerably more soluble in water than the corresponding aconitine salt. The physiological action of pure aconine is being investigated. Its aqueous solution is slightly bitter, and gives rise to a burning sensation in the mouth, but does not produce the tingling which is characteristic of aconitine. In respect of its action on polarized light, aconine exhibits the same peculiarity as aconitine. Its salts are lævo-rotatory, whilst a solution of the free base is dextro-rotatory $[\alpha]_D + 23°$. When heated with alkalies aconine slowly resinifies.

The study of the hydrolysis of aconitine has led to the conclusion that aconitine is monobenzoyl aconine ($C_{26}H_{40}(C_6H_5CO)NO_{11}$). In order to substantiate this inference from the analytical results and prove that aconine really stands in this simple relation to aconitine, experiments were made with a view of reversing the hydrolysis and reconverting aconine into aconitine. The action of benzoic anhydride on aconine at different temperatures led to no result, not a trace of aconitine or anhydro-aconitine being formed. Since aconine is a comparatively strong base, it seemed likely that it might be competent to decompose ethyl benzoate with formation of aconitine, or anhydro-aconitine if the temperature of reaction were high, according to the equations (1) $C_{26}H_{41}NO_{11} + C_6H_5CO{\cdot}OC_2H_5 = C_{26}H_{40}(C_6H_5CO)NO_{11} + C_2H_5OH$. (2) $C_{33}H_{45}NO_{12} = H_2O + C_{33}H_{43}NO_{11}$. Aconine was dissolved in alcohol, the alcoholic solution mixed with rather more than the calculated quantity of the alkyl salt, and the mixture heated in a closed tube for three hours at 130°. After removal of the unaltered ethyl benzoate, etc., a base soluble

in ether was isolated, and this furnished a crystalline hydrobromide which corresponded with the salt of anhydro-aconitine. The aurochloride melted at 141°, and is thus proved to be anhydro-aconitine aurochloride. The alkaloid produced the physiological action characteristic of anhydro-aconitine ($C_{33}H_{43}NO_{11}$), and was identical with that obtained by the dehydration of aconitine. Since the anhydro-compound combines with water to form aconitine, this result constitutes a partial synthesis of the natural alkaloid, and proves it to be monobenzoyl aconine.

The examination of the action of various reagents on aconine has, so far, not led to any important results. Nitrous acid fails to attack it. The principal product of its oxidation by alkaline permanganate is oxalic acid. Attempts to isolate an addition compound with methyl iodide were not successful. By the action of methyl iodide on aconitine, a crystalline *aconitine methyl iodide* ($C_{33}H_{45}NO_{12},CH_3I$) was obtained which melts at 219° (corr.). The *aconitine methyl hydroxide* ($C_{33}H_{45}NO_{12}CH_3OH$) prepared from this compound is an amorphous base whose salts do not appear to crystallize. A further study will be made of this compound and its physiological action will be investigated.

ON THE FLORA OF NORTHERN OHIO.

By Edo Claassen.

[*Concluded from p. 170.*]

Not many days was the botanist at home, when he happened to read in the "Geological Survey of Ohio" communications in regard to the presence of lakes and ponds in the interior of the State not far from his residence, as well as notes on very rare and remarkable plants growing in and along them. At this point his eyes flashed, and, the weather being fair, he started early the next day to explore also these renowned localities. Swamps and peatbogs often border these lakes and ponds; those nearest to Cuyahoga County are: (1) Strutton Pond, Geauga and Crystal Lakes; (2) Silver, Congress, Cottage Grove and Chippewa Lakes, and (3) the Twin Lakes, Lake Pepin and Brady's Lake, of which those under (1) have on their border partly peatbogs, those under (2) swamps, and those under (3) almost everywhere meadows. According to this fact the botanist will find, on an average, most of the rare plants in (1) more than in (2), and here more than in (3). Although he had ascertained that lakes, having a similar soil on their borders, can mostly boast of the same species of plants, he yet had to acknowledge that most of them have, at least according to his explorations, some species, peculiar to one of them; for instance, to Geauga Lake, Calopogon pulchellus, *R. Br.*, Pogonia ophioglossoides, *Nutt.*, Drosera rotundifolia, *Linné*, Carex retrorsa, *Schweinitz*, and Riccia fluitans,

Lin.; to Strutton Pond, Xyris flexuosa, *Muhlenberg*, Menyanthes trifoliata, *Lin.;* to Silver Lake, Eleocharis quadrangulata, *R. Br.*, Juncus marginatus, *Rostk.;* to Chippewa Lake, Nelumbo lutea, *Pers;* to Cottage Grove Lake, Myosotis laxa, *Lehm.*, Rhus copallina, *Lin.*, Equisetum lævigatum, *Braun*, Heteranthera graminea, *Vahl;* to Crystal Lake (north of Silver Lake) Spiræa tomentosa, *Lin.*, Eleocharis olivacea, *Torr.*, Scirpus debilis, *Pursh;* to Congress Lake, Solidago uliginosa, *Nutt.*, Gerardia tenuifola, *Vahl.* The following species he found on the various lakes, viz: Vaccinium corymbosum, *Lin.* (Geauga and Silver Lake), Cassandra calyculata, *Don*, (Strutton Pond, Geauga and Crystal Lakes), Eriophorum virginicum, *Lin.* (on the same lakes and ponds), Sarracenia purpurea, *Lin.* (Geauga Lake and Strutton Pond), Rynchospora alba, *Vahl* (Crystal and Geauga Lakes), Rynchospora glomerata, *Vahl* (Crystal and Silver Lakes), Dulichium spathaceum, *Pers.* (Silver, Geauga, Congress and Chippewa Lakes), Vallisneria spiralis, *Lin.*, Brasenia peltata, *Pursh* (Silver and Geauga Lakes), Hydrocotyle umbellata, *Lin.* (Twin and Congress Lakes), Aster oblongifolius, *Nutt.* (Geauga and Congress Lakes). Besides these he collected there, Woodwardia virginica, *Smith*, Elodes campanulata, *Pursh*, Vaccinium macrocarpon, *Ait.*, Pyrus arbutifolia, *Lin. f.*, Rhus venenata, *D C.*, Viburnum cassinoides, *Lin.*, Glyceria canadensis, *Trin.*, Carex Pseudocyperus var. americana, *Hochst.* The botanist, before leaving the lakes, had yet time enough to subject the lakes having peatbogs on their border to close observations; he found that long ago their surfaces of water were larger and that they will gradually disappear, being at last entirely replaced by peatbogs. There are many bogs in this vicinity in place of former lakes, of which one only, a swamp west of Ravenna, Portage County, may be mentioned here. On its lower part it is covered with Sphagnum recurvatum, *Beauv.;* it is made almost impenetrable by bushes of Cephalanthus occidentalis, *Lin.*, in the shade of which among the moss the delicate Carex trisperma, *Dewey*, may be seen. The higher part, the so-called former border, is now covered with woods; several important species live there; for instance, the majestic Frasera carolinensis, *Walt.*, Tephrosia virginiana, *Pers.*, Lupinus perennis, *Lin.*, and Polygala sanguinea, *Lin.*, the latter on fields adjoining the woods.

The botanist whose time was until now mostly engaged by the above expeditions was at last able to devote his leisure hours to the territory between the lakes and Lake Erie. Deep ravines, the borders of which are often rocky and covered with trees and shrubs, pass through the counties of this region. Deposits of sand and also of clay, products of the decomposition of sandstone, and slate rocks cover a great part of the lower lands. By the manifoldness and the variety of soil it is but natural that, to the botanist, there appears a flora much different from that observed by him before. With pleasure he visits the ravines of Tinker's Creek (near Bedford), of Big Creek (near Brighton), of Euclid Creek, of the creek at Parma, that near Brecksville (all in Cuyahoga County) and the Nelson Ledges near Garretsville, Portage County, as also Little Mountain (partly in Lake, partly in Geauga County), the highest elevation in Northern Ohio, and traverses the valley of the Cuyahoga River. Among others he brought home from Tinker's Creek: Hypericum Ascyron, *Lin.*, Juniperus communis var. alpina, *Gaud.*, Taxus canadensis, *Willd.*, Acer spicatum, *Lam.;* from Big Creek: Epigæa repens, *Lin.*, Asimina triloba, *Dunal*, Panicum agrostoides, *Muhl.*, Gentiana Andrewsii, *Griseb.;* from the creek at Euclid: Astragalus

Cooperi, *Gray*, Cassia marilandica, *Lin.*, Quercus Prinus, *Lin.;* from the creek at Parma: Aristolochia Serpentaria, *Lin.*, the Virginia snakeroot, Lonicera ciliata, *Muhl*, Festuca nutans, *Willd.*, Carex pedunculata, *Muhl.*, C. platyphylla, *Carey*, C. Willdenowii, *Schkuhr*, Carex plantaginea, *Lam.*, Eatonia pennsylvanica, *Gray*, E. obtusata, *Gray*, Cynoglossum virginicum, *Lin.*, Conocephalus conicus, *Dumort;* from the creek near Brecksville: Goodyeara pubescens, *R. Brown;* from Nelson Ledges: Veronica officinalis, *Lin.*, Carex Jamesii, *Schweinitz*, Camptosurus rhizophyllus, *Link*, (afterwards found in several ravines always on sandstone rocks); from Little Mountain: Myrica asplenifolia, *Endl.*, Cypripedium acaule, *Ait.*, Aralia hispida, *Vent.*, Circæa lutetiana, *Lin.*, C. alpina, *Lin.*, both on *the same* big piece of rock in a moist place. The Valley of the Cuyahoga is wide and extends far; an excursion of a few days even would not make the botanist familiar with its plants, and indeed he has for several years spent his leisure hours there without having reached the end of his explorations, which furnished him the following rare or important plants: Cacalia suaveolens, *Lin.* (in one place only about 50 specimens), Solidago squarrosa, *Muhl.* (very rare), Gentiana quinqueflora, *Lam.*, Prenanthes alba, *Lin.*, Gaura biennis, *Lin.*, Quercus palustris, *Du Roi*, Silphium perfoliatum, *Lin.*, Lophanthus scrophulariæfolius, *Benth.*, Holcus lanatus, *Lin.*, Eragrostis Purshii, *Schrader*, E. Frankii, *Meyer* (3 specimens only), Sporobolus vaginæflorus, *Vasey*, Solanum carolinense, *Lin.*, Riccia natans, *Lin.* In its upper parts the river forms a ravine with a most grotesquely beautiful scenery. People from near-by and far-off come to see this romantic place, Cuyahoga Falls. Neither the big rocks and the cataracts, however, nor the roaring of the water alone drew the friend of nature, the botanist, to this place; his expectation to become acquainted with new friends was no less the cause of his departure from home. He did not go in vain, as the names of Asplenium montanum, *Willd.*, Muhlenbergia glomerata, *Trin.*, Conioselinum canadense, *Torr.* and *Gray*, Chrysosplenium americanum, *Schwein.*, were entered here on his list, as also Aconitum noveboracense, *Gray*, a plant occurring in several counties in the State of New York; it grows here abundantly (several hundred specimens) in the shade of moist rocks.

Although the above lines give the names of many plants, which grow in the vicinity of the botanist's home, yet none of his friends would from this list get an exact idea of the vegetation there; he cannot therefore resist—it is his duty to do it—extending the same by communicating quite a number of more or less important ones, which were found by him in that hill and valley district, but of which, it is needless to state, many were also met with in one or the other of the remaining districts:

Clematis virginiana, *Lin.*, Anemone cylindrica, *Gray*, A. virginiana, *Lin.*, A. pennsylvanica, *Lin.*, A. nemorosa, *Lin.*, Hepatica triloba, *Chaix*, H. acutiloba, *D.C.*, Anemonella thalictroides, *Spach*, Thalictrum purpurascens, *Lin.*, T. dioicum, *Lin.*, T. polygamum, *Muhl.*, Ranunculus abortivus, *Lin.*, R. recurvatus, *Poir.*, R. ambigens, *Watson*, R. pennsylvanicus, *L. f.*, Caltha palustris, *Lin.*, Aquilegia canadensis, *Lin.*, Cimicifuga racemosa, *Nutt.*, Actæa alba, *Bigel.*, A. spicata var. rubra, *Aiton*, Coptis trifolia, *Salisb.*, Hydrastis canadensis, *Lin.*, Magnolia acuminata, *Lin.*, Liriodendron Tulipifera, *Lin.*, Menispermum canadense, *Lin.*, Caulophyllum thalictroides, *Michx.*, Jeffersonia diphylla, *Pers.*,

Podophyllum peltatum, *Lin.*, Nelumbo lutea, *Pers.*, Nymphæa odorata, *Ait.*, Nuphar advena, *Ait. f.*, Sanguinaria canadensis, *Lin.*, Dicentra Cucullaria, *D. C.*, D. canadensis, *D. C.*, Dentaria diphylla, *Lin.*, D. laciniata, *Muhl.*, Nasturtium officinale, *R. Br.*, Erysimum cheiranthoides, *Lin.*, Helianthemum canadense, *Lin.*, Lechea major, *Michx.*, L. minor, *Lin.*, Viola palmata, *Lin.*, V. sagittata, *Ait.*, V. hastata, *Michx.*, V. rostrata, *Pursh*, V. striata, *Ait.*, Saponaria officinalis, *Lin.*, S. Vaccaria, *Lin.*, (very rare), Silene stellata, *Ait.*, Stellaria longifolia, *Muhl.*, S. longipes, *Goldie*, Claytonia virginica, *Lin.*, Hypericum prolificum, *Lin.*, Malva moschata, *Lin.*, Abutilon Avicennæ, *Gaertn.*, Geranium maculatum, *Lin.*, G. carolinianum, *Lin.*, Flœrkea proserpinacoides, *Willd.*, Oxalis violacea, *Lin.*, Celastrus scandens, *Lin.*, Evonymus atropurpureus, *Jacq.*, Rhamnus alnifolia, *L'Her.*, Ceanothus americanus, *Lin.*, Acer saccharinum, *Wang.*, A. dasycarpum, *Ehrh.*, A. rubrum, *Lin.*, Negundo aceroides, *Moench*, Staphylea trifolia, *Lin.*, Rhus glabra, *Lin.*, R. typhina, *Lin.*, R. Toxicodendron, *Lin.*, Polygala polygama, *Walt.*, P. verticillata var. ambigua, *Nutt.*, Baptisia tinctoria, *R. Br.*, Lupinus perennis, *Lin.*, Lathyrus venosus, *Muhl.*, L. palustris, *Lin.*, L. ochroleucus, *Hook.*, Amphicarpæa monoica, *Nutt.*, Cassia marilandica, *Lin.*, Gleditschia triacanthos, *Lin.*, Prunus virginiana, *Lin.*, P. serotina, *Ehrh.*, P. pennsylvanica, *L. f.*, Spiræa salicifolia, *Lin.*, Rubus odoratus, *Lin.*, R. strigosus, *Michx.*, R. villosus, *Ait.*, R. occidentalis, *Lin.*, Poterium canadense, *Bent.* and *Hook.*, Amelanchier canadensis, *Torr.* and *Gray*, Saxifraga virginiensis, *Michx.*, Ribes floridum, *L'Her.*, R. prostratum, *L'Her.*, R. Cynosbati, *Lin.*, R. oxyacanthoides, *Lin.*, Hamamelis virginica, *Lin.*, Echinocystis lobata, *Torr.* and *Gray*, Angelica hirsuta, *Muhl.*, Pimpinella integerrima, *Benth.* and *Hook.* Sium cicutæfolium, *Gmelin*, Berula angustifolia, *Koch*, Cicuta maculata, *Lin.*, C. bulbifera, *Lin.*, Conium maculatum, *Lin.* (very rare), Erigenia bulbosa, *Nutt.*, Hydrocotyle americana, *Lin.*, Aralia nudicaulis, *Lin.*, A. racemosa, *Lin.*, A. trifolia, *Decsne.* and *Planch.*, A. quinquefolia, *Decsne.* and *Planch.*, Cornus florida, *Lin.*, C. sericea, *Lin.*, C. circinata, *L'Her.*, Nyssa sylvatica, *Marsh.*, Sambucus canadensis, *Lin.*, S. racemosa, *Lin.*, Viburnum dentatum, *Lin.*, V. pubescens, *Pursh*, Triosteum perfoliatum, *Lin.*, Lonicera ciliata, *Muhl.*, Houstonia purpurea var. ciliolata, *Gray*, Cephalanthus occidentalis, *Lin.*, Mitchella repens, *Lin.*, Galium triflorum, *Michx.*, G. trifidum, *Lin.*, Dipsacus sylvestris, *Mill.*, Vernonia Noveboracensis, *Willd.*, Eupatorium sessilifolium, *Lin.*, E. perfoliatum, *Lin.*, E. purpureum, *Lin.*, Solidago cæsia, *Lin.*, S. latifolia, *Lin.*, S. bicolor, *Lin.*, S. uliginosa, *Nutt.*, S. patula, *Muhl.*, S. rugosa, *Mill.*, S. ulmifolia, *Muhl.*, S. arguta, *Ait.*, S. juncea, *Ait.*, S. serotina, *Ait.*, S. canadensis, *Lin.*, S. nemoralis, *Ait.*, S. lanceolata, *Lin.*, Sericocarpus conyzoides, *Nees*, Aster corymbosus, *Ait.*, A. macrophyllus, *Lin.*, A. Novæ-Angliæ, *Lin.*, A. patens, *Ait.*, A. cordifolius, *Lin.*, A. sagittifolius, *Willd.*, A. lævis, *Lin.*, A. ericoides, *Lin.*, A. dumosus, *Lin.*, A. vimineus, *Lam.*, A. diffusus, *Ait.*, A. paniculatus, *Lam.*, A. prenanthoides, *Muhl.*, A. puniceus, *Lin.*, A. umbellatus, *Mill.*, Inula Helenium, *Lin.*, Silphium trifoliatum, *Lin.*, Helianthus parviflorus, *Bernh.*, H. giganteus, *Lin.*, H. doronicoides, *Lam.*, H. strumosus, *Lin.*, H. decapetalus, *Lin.*, Actinomeris squarrosa, *Nutt.*, Helenium autumnale, *Lin.*, Galinsoga parviflora, *Cav.* (very scarce), Tanacetum vulgare, *Lin.*, Artemisia biennis, *Willd.*, Cacalia atriplicifolia, *Lin.*, Tragopogon porrifolius, *Lin.*, Prenanthes altissima,

Lin., Lactuca Scariola, *Lin.*, L. leucophæa, *Gray*, L. integrifolia, *Bigel.*, Lobelia inflata, *Lin.*, L. cardinalis, *Lin.*, Gaylussacia resinosa, *Torr.* and *Gray*, Vaccinium stamineum, *Lin.*, V. vacillans, *Solander*, Gaultheria procumbens, *Lin.*, Chimaphila umbellata, *Nutt.*, C. maculata *Pursh*, Monotropa uniflora, *Lin.*, M. Hypopitys, *Lin.*, Lysimachia quadrifolia, *Lin.*, Apocynum androsæmifolium, *Lin.*, A. cannabinum, *Lin.*, Asclepias tuberosa, *Lin.*, A. Cornuti, *Decaisne*, A. incarnata, *Lin.*, A. phytolaccoides, *Pursh*, A. quadrifolia, *Lin.*, A. purpurascens, *Lin.*, Vincetoxicum nigrum, *Moench* (on R. R.), Gentiana quinqueflora, *Lin.*, Hydrophyllum virginicum, *Lin.*, H. canadense, *Lin.*, H. appendiculatum, *Michx.*, Cynoglossum officinale, *Lin.*, Echinospermum Lappula, *Lehm.*, Echium vulgare, *Lin.* (on R. R.), Mertensia virginica, *D. C.*, Solanum Dulcamara, *Lin.*, S. nigrum, *Lin.*, S. rostratum, *Dunal* (1 specimen on R. R.), Physalis pennsylvanica, *Lam.*, P. viscosa, *Lin.*, Datura Stramonium, *Lin.*, Verbascum Thapsus, *Lin.*, V. Blattaria, *Lin.*, Linaria vulgaris, *Mill.*, Chelone glabra, *Lin.*, Mimulus ringens, *Lin.*, Veronica virginica, *Lin.*, Gerardia quercifolia, *Pursh*, G. flava, *Lin.*, Pedicularis canadensis, *Lin.*, Epiphegus virginiana, *Bart.*, Conopholis americana, *Wallroth*, Aphyllon uniflorum, *Gray*, Tecoma radicans, *Juss.*, Verbena urticæfolia, *Lin.*, V. hastata, *Lin.*, Collinsonia canadensis, *Lin.*, Mentha piperita, *Lin.*, M. viridis, *Lin.*, Pycnanthemum lanceolatum, *Pursh*, Melissa officinalis, *Lin.* (on road outside of a village), Hedeoma pulegioides, *Pers.*, Monarda didyma, *Lin.*, M. fistulosa, *Lin.*, Blephilia hirsuta, *Benth.*, Scutellaria lateriflora, *Lin.*, S. canescens, *Nutt.*, S. versicolor, *Nutt.*, Leonurus Cardiaca, *Lin.*, Chenopodium urbicum, *Lin.*, C. Botrys, *Lin.*, C. ambrosioides, *Lin.*, Atriplex patulum, *Lin.*, Phytolacca decandra, *Lin.*, Polygonum lapathifolium, *Lin.*, P. amphibium, *Lin.*, P. pennsylvanicum, *Lin.*, P. virginicum, *Lin.*, P. sagittatum, *Lin.*, P. arifolium, *Lin.*, Asarum canadense, *Lin.*, Saururus cernuus, *Lin.*, Sassafras officinale, *Nees*, Lindera Benzoin, *Blume*, Dirca palustris, *Lin.*, Shepherdia canadensis, *Nutt.*, Euphorbia Preslii, *Guss.*, E. corollata, *Lin.*, E. Cyparissias, *Lin.*, Celtis occidentalis, *Lin.*, Morus rubra, *Lin.*, Urtica dioica, *Lin.*, Platanus occidentalis, *Lin.*, Corylus americana, *Walt.*, Ostrya virginica, *Willd.*, Quercus alba, *Lin.*, Q. rubra, *Lin.*, Q. macrocarpon, *Michx.*, Q. bicolor, *Willd.*, Aplectrum hiemale, *Nutt.*, Corallorhiza odontorhiza, *Nutt.*, C. multiflora, *Nutt.*, Spiranthes latifolia, *Torr.*, S. cernua, *Rich.*, S. gracilis, *Bigelow*, Habenaria orbiculata, *Torr.*, H. lacera, *R. Br.*, H. psycodes, *Gray*, Cypripedium pubescens, *Willd.*, Iris versicolor, *Lin.*, Sisyrinchium anceps, *Cav.*, S. angustifolium, *Mill.*, Dioscorea villosa, *Lin.*, Smilax herbacea, *Lin.*, S. hispida, *Muhl.*, Allium tricoccum, *Ait.*, A. canadense, *Kalm*, Smilacina racemosa, *Desf.*, Uvularia perfoliata, *Lin.*, Oakesia sessilifolia, *Watson*, Erythronium albidum, *Nutt.*, E. americanum, *Ker.*, Lilium canadense, *Lin.*, Medeola virginica, *Lin.*, Trillium erectum, *Lin.*, T. grandiflorum, *Salisb.*, Pontederia cordata, *Lin.*, Juncus articulatus, *Lin.*, J. alpinus var. insignis, *Fries*, J. nodosus, *Lin.*, Arisæma triphyllum, *Torr.*, Peltandra undulata, *Raf.*, Acorus Calamus, *Lin.*, Cyperus filiculmis, *Vahl*, Carex intumescens, *Rudge*, C. lupulina, *Muhl.*, C. monile, *Tukerman*, C. lurida, *Wahl.*, C. hystricina, *Muhl.*, C. squarrosa, *Lin.*, C. stricta, *Lam.*, C. crinita, *Lam.*, C. Tukermani, *Dewey*, C. virescens, *Muhl.*, C. gracillima, *Schwein.*, C. granularis, *Muhl.*, C. laxiflora, *Lam.*, C. digitalis, *Willd.*, C. varia, *Muhl.*, C. pennsylvanica, *Lam.*, C. debilis var. Rudgei, *Bailey*, C. stipata, *Muhl.*, C. teretiuscula, *Gooden.*, C. vulpinoidea,

Michx., C. rosea, *Schkuhr*, C. cephaloidea, *Dewey*, C. cephalophora, *Muhl.*, C. echinata var. cephalantha, *Bailey*, C. canescens, *Lin.*, C. bromoides, *Schkuhr*, C. tribuloides, *Wahl.*, C. straminea, *Willd.*, Leersia oryzoides, *Swartz*, L. virginica, *Willd.*, Zizania aquatica, *Lin.*, Andropogon furcatus, *Muhl.*, A. scoparius, *Michx.*, Deschampsia flexuosa, *Vasey*, Cinna arundinacea, *Lin.*, Eleusine indica, *Gaertn.*, Poa alsodes, *Gray*, P. brevifolia, *Muhl.*, Festuca nutans, *Willd.*, Asprella Hystrix, *Willd.*, Equisetum robustum, *Braun*, Polypodium vulgare, *Lin.*, Adiantum pedatum, *Lin.*, Pteris aquilina, *Lin.*, Asplenium Trichomanes, *Lin.*, A. angustifolium, *Michx.*, A. thelypteroides, *Michx.*, Aspidium cristatum, *Swartz*, A. Goldianum, *Hooker*, A. acrostichoides, *Swartz*, Botrychium virginicum, *Swartz*, B. ternatum, *Swartz*, Lycopodium lucidulum, *Michx.*, Marchantia polymorpha, *Lin.*, Leucobryum vulgare, *Hampe*, Timmia megapolitana, *Hedwig*, Ceratodon purpureus, *Bridel*, Atrichum undulatum, *Beauv.*, A. angustatum, *Beauv.*, Funaria hygrometrica, *Hedw.*, Bartramia pomiformis, *Hedw.*, Aulacomnion heterastichum, *B.* and *S.*, Physcomitrium pyriforme, *B.* and *S.*, Climacium dendroides, *Web.* and *Mohr*, Polytrichum gracile, *Menzies*, P. juniperinum, *Hedw.*

The botanist, after having mentioned in the above lines many of his darlings and the places of their residence, is convinced that he has omitted quite a number that are equally dear to him. He knows—and finds some consolation therein—that all work of man is more or less imperfect. Nothing, however, but the expectation of seeing and greeting the omitted ones again at a time not far distant, causes him to forget his neglect and to sketch again plans for future travelling over hills and through valleys to the islands and lakes.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, March 15, 1892.

On motion of Mr. C. C. Meyer, Wm. B. Webb, Ph.M., was called to preside.

The minutes of the last meeting were read, and no corrections being called for, they stand approved.

The following donations to the library were made on behalf of Mr. Hans M. Wilder: Receptirkunst, by H. Hager; Pharmacopœæ recentiores, by H. Hager; Allgemeine Pharmakopöe, by F. L. Strumpf; Commentar, by H. Hager (2 vol.), by F. Mohr (1 vol.), and by Dulk (2 vol.); Pharmaceutische Technik, by F. Mohr; Anorganische Chemie, by R. Arend; Organische Chemie, by F. Wöhler; Ure's Dictionary of Chemistry; Cell Doctrine, by Dr. Jas. Tyson; Domestic Medicine, by W. Buchan, M.D.; Hance's Medical Compendium and Formulary, and American Journal of Pharmacy for 1834.

On motion, a vote of thanks was returned to Mr. Wilder.

The Chairman said that the Paddock Bill, which recently passed the Senate, had been put down as a subject for discussion. The clause defining adulteration was then read.

Professor Maisch said that the enactment of a stringent law for the prevention and punishment of adulterations was very desirable; yet he could not join in the assertion sometimes made, that adulterations were more commonly practised now than in the past. It was a matter of history that, in the middle ages, persons convicted of such frauds had been burned to death. It

was, however, unquestionably true that with the general spreading of knowledge, the more clumsy methods formerly practised were abandoned in favor of others. He was of the opinion that the demand for good articles at fair prices would bring good articles, and that the success in the sale of poor articles was largely due to the demand for articles cheaper than they can be honestly produced. Ground spices, for instance, are often sold for less than the same spices in their natural condition can be bought; and consumers are aware of that fact or could easily ascertain it.

Mr. Thompson suggested that there were three parties concerned in this business of debasing drugs and food products; they were the buyer, the seller and the devil; the latter being intangible, the blame must rest practically with the others; the buyer generally is the more culpable, because he is looking for the cheaper article, which, of course, drives the seller to obtaining the lower grade, and this may possibly be injurious to health. The microscope, however, of late years has been used with most salutary results in checking or at least in exposing these frauds.

As a proof that fair prices will bring good articles, Professor Maisch instanced the article of virgin scammony, which, as met with in our market thirty or forty years ago, usually contained only about forty per cent. of resin, while standard authorities called for eighty per cent. But after Dr. Squibb had induced some importers to import for his use virgin scammony, without limitation of price, the drug could be had with from 80 to over 90 per cent. of resin, and it is now sold by actual assay. Another fact worthy of consideration is, that it is extremely difficult to define precisely what adulteration is, since the public have become so accustomed to certain additions, that in some cases absolutely pure articles were almost unsalable. Ground yellow mustard had often been mentioned as such an article, which most persons would not purchase unless it had been colored yellow by turmeric; and it was an open secret that much of the butter sold was more or less improved in color by arnotta or similar matter. Many of such additions were not injurious to health; yet it was certainly a fraud to sell as pure lard a mixture of lard and the solid fat of cotton-seed oil. He thought that there was probably not half a pound of absolutely pure saffron in Philadelphia or others of our large cities; the best European saffrons generally sold, contained some impurities besides the stigmas, sometimes amounting, perhaps, to only three per cent., but frequently to more, and consisting of styles, and occasionally also of stamens and shreds of the corolla. Even the best of such saffron could not be sold in some localities in Eastern Pennyslvania where saffron is raised for home consumption, and where it had been the custom of parting with any surplus only for its weight of silver.

Several members referred to cases of fraud which had been exposed in former years, like an adulterant for castor-oil that had been offered by a Cleveland house; the selling by a New York house of cinchonine hydrochloride for quinine sulphate, in bottles bearing the counterfeit label of Pelletier in Paris; the manufacture in this city of colored biscuits for use in the adulteration of ground spices; also the adulteration of lycopodium with corn starch, and others.

It was stated that some wholesale dealers claimed that articles ground at drug mills might be adulterated without their knowledge; but in reply it was said

that some parties would expect the weight of the ground drug to be equal to that of the crude drug furnished, while there was an unavoidable loss by drying, unpowdered remnants and by handling.

Professor Trimble gave the results of the assay of a number of preparations which has been procured from retail stores, and said that he would embody the figures in a paper; the examination showed much want of care on the part of some retailers.

A paper on *Sodium Benzoate*, by H. F. Kaercher, of the present senior class, was read, and led to a discussion about the various kinds of benzoic acid on the market; it was stated that benzoic acid sublimed from benzoin could be procured, but that a great deal was artificially prepared from toluol; also that formerly there was a variety on the market made from the urine of cattle, to which the urinous odor adhered very persistently until it had been sublimed with some benzoin.

F. W. Haussmann's paper *upon soda mint* was read by Dr. C. B. Lowe. The discussion showed that spearmint water had been used by nearly all the members present.

Dr. Lowe exhibited *Shannon's prescription file* and cases. It consists of a board with two curved steel wires and a covering board with spring, which keeps the prescriptions flat. To examine a prescription the covering board is raised and thrown back, when the prescriptions can be slid back upon the curved wire until the one wanted is found. The cases are made somewhat like the sides and back of a book, the bottom board of the file being fastened to one side of the case when the file is filled and ready to be put away; a pasteboard cover fits over the ends and side of the file to enclose it and prevent access of dust. It is made by the Office Specialty Company, of Rochester, N. Y.

Mr. Beringer sent the *Lehman prescription file* for inspection of the meeting. It consists of a small inclined board fastened to a little case containing a wrench, eyelets and washers; the prescriptions are perforated by the eyeleting machine, and when two hundred have been collected the washer is slipped over the end of the eyelet, which is then crimped down, securely locking all the prescriptions; the prescriptions are then packed in small flat boxes of a size suited to the prescription papers, and packed away in a tin frame, which will hold eight such boxes; on the end of the box the initial and concluding number of each series is marked; the frame is so arranged that each one added fits on the top of the last one filled up. It is made by the Minneapolis (Minn.) Specialty Manufacturing Company.

Mr. England exhibited a sample of *Ammonium carbonate* tinged with iron; also *piperazin*, a derivative of piperine and a solvent for uric acid; it is made by E. Schering, of Berlin.

There being no further business, adjournment was moved and carried.

T. S. WIEGAND, *Registrar.*

EDITORIAL.

Professor F. B. Power, with the present month, severs his connection with the School of Pharmacy of the University of Wisconsin, which, under his guidance since its organization, nine years ago, has established a well-deserved reputation, not only in the State, but far beyond its boundaries. Professor

Power will hereafter reside at Passaic, N. J., where the preparation of volatile oils and allied products will be carried on under his direction, affording him ample opportunities for continuing his researches in a congenial field. Previous to his departure from Madison a farewell banquet was tendered him by his friends at the hotel Van Etta, on the evening of March 23d.

The Massachusetts College of Pharmacy has filled the vacancy occasioned by the death of Professor Pengra, by calling Dr. R. W. Greenleaf, who had been for some time connected with the College, to the chair of Materia Medica and Botany. In the same College the chair of Pharmacy became vacant through the resignation of Prof. Patch, owing to the demands upon his time by business affairs. This vacancy was filled by the appointment of Professor G. F. H. Markoe, who has been a member of the faculty since the College became a teaching institution in December 1867.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Pharmaceutical Review, a monthly journal, published in the interest of pharmacy and allied sciences. Baltimore. 4to. Price, $2 per year.

This is the title of a new journal which is published under the auspices of the Maryland College of Pharmacy, and of which Prof. Chas. Caspari, Jr., is the editor. It begins its course with a very creditable number of twenty pages, containing original articles on scientific subjects by Prof. W. Simon, and Dr. A. Dohme, and on business subjects by C. V. Emich, Dr. D. R. Slack and J. P. Piquett. In addition thereto editorials, résumés of pharmaceutical literature, college news, etc.

Proceedings of the Michigan State Pharmaceutical Association, at its ninth annual meeting, held at Ann Arbor, October 20, 21, 22, 1891. Detroit. 8vo. Pp. 140.

Besides the discussions on cut rates and the proposed methods for curing that evil, the reading and discussion of papers occupied much of the time of the association. Many of the papers, a number of which had been previously published in the last volume of this journal, came from the University of Michigan, and were mostly presented in abstract, such as the work done on the examination of chemicals with regard to their purity, the determination of adulterations in various articles, etc. Professor Stevens contributed elaborate saturation tables; Prof. Vaughan made an address on the relation of pharmacy to medicine, and Prof. Abel discoursed on the methods of pharmacology and demonstrated the effects of several drugs upon animals. The executive officers for the year are H. G. Colman, Kalamazoo, president; Wm. Dupont, Detroit, treasurer; C. W. Parkins, Detroit, secretary, and J. D. Muir, Grand Rapids, local secretary. The tenth annual meeting will be held at Grand Rapids, commencing August 2, next.

Practical and Analytical Chemistry. A complete course in chemical analysis. By Henry Trimble, Ph. M., Professor of Analytical Chemistry in the Philadelphia College of Pharmacy. Fourth edition, with illustrations. Philadelphia: P. Blakiston, Son & Co., 1892. 8vo. Pp. 119.

It affords us much pleasure to note the appearance of a new edition of this

work, of the value of which, for educational purposes and for reference, we have heretofore advised our readers (see this Journal, 1885, 462; 1886, 414). It remains for us now to merely state that the work has been revised, additions or changes having been made wherever experience had shown such to be desirable or useful, so that in its present shape it will be found to be fully as acceptable as heretofore.

Jahresbericht. (Annual Report.) E. Merck, Darmstadt. January, 1892. Pp. 87.

One of the papers relates to the alkaloid *atropamine*, which the author prepared from mother-liquors of atropine; it was demonstrated to be identical with *apoatropine*. The second paper gives the results of some observations on commercial oils of eucalyptus, and on the preparation of terpin hydrate from the same. The remainder of the report gives résumés of the action, character, etc., of a large number of recently introduced remedies. In the appended literary list, the American Journal of Pharmacy is quoted as being published in New York instead of Philadelphia.

Sixth Annual Report of the Massachusetts Board of Registration in Pharmacy. For 1891.

During the year, 315 candidates applied for examination and registration, of which number 115 were successful.

Ueber Dichlormethylparaconsäure. Von Harry C. Myers, Cleveland, O. 8vo. Pp. 16.

On dichlormethylparaconic acid is the title of this inaugural dissertation, presented by the author to the faculty of mathematics and natural history of the University of Strassburg. It gives the process for preparing this acid and a number of its salts; also analyses of the same.

The reception of the following pamphlets on medical subjects is acknowledged:

Notes on general versus local treatment of catarrhal inflammations of the upper air-tract. By Beverly Robinson, M. D., New York.

Reprint from the Climatologist, December, 1891.

Tuberculin: the value and limitation of its use in consumption. By Chas. Denison, A. M., M. D., etc., Denver, Col.

Reprint, with revisions up to February 1, 1892, from the Transactions of the Colorado State Medical Society for 1891.

An account of the Influenza as it appeared in Philadelphia in the winters of 1889–'90 and of 1891–'92. By J. Howe Adams, M. D., Philadelphia.

Reprint from University Medical Magazine, February, 1892.

Tobacco, Insanity and Nervousness. By Dr. L. Bremer. Published by the Meyer Bros. Druggist. St. Louis, Mo., 1892.

Read before the St. Louis Medical Society.

Proceedings of the California Pharmaceutical Society and College of Pharmacy for the years 1890 and 1891. San Francisco, 1892. 8vo. Pp. 136.

The book contains the minutes of, and the papers read at, the semi-annual meetings of the Society held in San José, 1890, and in Stockton, 1891, and of

the annual meetings, held November 1890 and 1891, at the hall of the College of Pharmacy in San Francisco; also, accounts of the graduating exercises of the College at the close of its lecture seasons in October of the years named. The executive officers of the Society and the College are: John Devine, president; D. D. Hunt, secretary, and Adolph Mack, treasurer. The vacancy which was occasioned through the resignation of Professor E. W. Runyon, has been filled by calling Henry F. Meier to the chair of Pharmacy.

Report of the Proceedings of the Illinois Pharmaceutical Association at its twelfth annual meeting, held at Kankakee August 25–27, 1891. 8vo. Pp. 178.

It contains the minutes, with the discussions incorporated, the reports of committees, papers read, the State pharmacy law, etc., but no index or list of contents. The portrait of A. A. Culver, president of the preceding year, is attached as frontispiece. The present officers are R. C. Hattenhauer, Peru, president; Melle Williams, Taylorville, treasurer; C. S. Hallberg, Chicago, secretary, and Chas. Ryan, Springfield, local secretary. The next meeting will convene at Springfield, June 14, next.

Proceedings of the tenth annual meeting of the Indiana Pharmaceutical Association, held in Indianapolis May 6 and 7, 1891. 8vo. Pp. 108.

A brief account of the transactions will be found on page 370 of our last volume. The next meeting will be held at Indianapolis May 10, next. J. F. Hurty is chairman of the executive committee.

Proceedings of the Ohio State Pharmaceutical Association at its thirteenth annual meeting held in Dayton June 9–11, 1891. 8vo. Pp. 162.

The transactions at this meeting were reported on page 371 of our last volume. In addition to the usual matter contained in such publications, complete lists of the registered pharmacists and assistant pharmacists are published in the volume before us. The frontispiece is a portrait of the late Alfred Mayell of Cleveland. The association will meet again at Canton June 14, next; J. H. Openheimer is the local secretary.

Elixirs and Flavoring Extracts: their history, formula and methods of preparation. By J. U. Lloyd, Professor of Chemistry in the Eclectic Medical Institute, etc. New York: Wm. Wood & Co. 1892. 8vo. Pp. 191.

This essay opens with a short dissertation on the etymology of the word elixir, furnished by Dr. Chas. Rice, and with the fac-simile reproduction, from a work of 1682, of the formulas for elixir album and elixir rubrum, which were recommended for use in the transmutation of the baser metals into silver or gold. After giving a historical sketch of the introduction of the modern elixirs and of their increase in number in North America, the author gives formulas for 271 different elixirs, which are more or less in use in some parts of this country; also formulas for flavoring extracts, soda-water syrups, colors, frothing-liquids and similar soda-water appliances. It is a practical book and gives much useful information on details.

The Book of Prescriptions, containing upwards of 3000 prescriptions collected from the practice of the most eminent physicians and surgeons, English and foreign; comprising also a compendious history of the materia medica, lists of the doses of all official or established preparations and an index of

diseases and remedies. By Henry Beasley. Seventh edition. Philadelphia: P. Blakiston, Son & Co. 1892. 16mo. Pp. 599.

The title of this compilation is quite descriptive of the contents of the book. The remedies, arranged in alphabetical order, are briefly defined as to origin and character; then their medical properties are named, and the diseases in which each drug has been recommended; and finally the behavior to solvents, the vehicle in which the drug is best exhibited, the dose, and the pharmaceutical preparations containing the drug. Such information is introductory to the formulary proper. As might be expected the number of prescriptions given varies very considerably, and naturally is depending upon the importance of each drug as a remedial agent. The selections appear to have been well made, credit being given to a large number of prominent physicians. An index of diseases is appended, in which the various drugs are indicated, under the heads of which appropriate prescriptions are found.

OBITUARY.

Professor Dr. Hermann Kopp died at Heidelberg February 20, 1892, in the seventy-fifth year of his age. He was the son of Joh. Heinrich Kopp, M.D., a physician of considerable reputation, and was born in Hanau, October 30, 1817. After studying natural sciences at the universities of Heidelberg, Marburg and Giessen, he was connected with the latter as lecturer (1841), professor extraordinary (1843) and professor of physics and chemistry (1853) until 1864, when he accepted a similar position at the university of Heidelberg, retiring from the chair in 1890. His researches were mainly devoted to chemical physics, such as atomic volume, crystallography, isomorphism, boiling point, specific gravity, the relation of chemical composition and physical properties, etc., the results of his labors having been mostly published in Poggendorff's Annalen and in the Annalen der Chemie und Pharmacie (Liebig's). Of the latter periodical he was co-editor with Liebig, Woehler and others from 1851 to 1871; from 1847 to 1862 co-editor of the Jahresbericht der Chemie, and one of the contributors to the Handwörterbuch (1842–1861). Aside from his important labors in the laboratory and in connection with the publications indicated, his historical studies are of pre-eminent value. His history of chemistry appeared in 1843 to 1847 in four volumes, and was followed from 1869 to 1875 by three volumes of contributions to the history of chemistry; in 1873 by a stately volume treating of the development of chemistry in modern times, and in 1886 by two volumes on the history of alchymie. As a teacher Kopp was highly appreciated not only for his eminent knowledge, but likewise for urbanity and kindly interest in his students.

Wellington H. Boyle died near Hughesville, Pa., January 30, 1892. Previous to 1871 Mr. Boyle attended for a series of years to the business of the American Journal of Pharmacy, while the late Chas. Ellis was chairman and treasurer of the publication committee. Mr. Boyle was for more than thirty years connected with the house of Chas. Ellis & Co., afterward Chas. Ellis, Son & Co., and for some time was one of the partners. After the dissolution of the firm about fourteen years ago he lived on his farm, where he died in the seventy-eighth year of his age.

Samuel Campbell, Ph.G., died in Philadelphia, February 19, 1892, of consumption, aged 56 years. He was an apprentice of the late Henry C. Blair and graduated from the Philadelphia College of Pharmacy in 1857. He was in business for several years in this city, and subsequently was associated with several manufacturing firms. He paid much attention to the perfection of the process of percolation, and contributed to this Journal a number of papers on this subject and on fluid extracts.

Dr. Theophilus Redwood, Emeritus Professor of Chemistry and Pharmacy to the Pharmaceutical Society of Great Britain, died March 5 last, at Boverton, Glamorganshire, South Wales, in the house where he was born March 2, 1806. His early education was obtained from his father who was a schoolmaster in the village named. After spending three years as apprentice to the drug business in Cardiff, he had the good fortune of securing, in 1823, an engagement with John Bell & Co., in London. Faithful in the discharge of all his duties, he was promoted from one position to another, and when Jacob Bell, who was four years younger than Redwood, became connected with the business a warm attachment between the two was formed and, fostered by their common studies, ripened into friendship which was only severed by the death of Mr. Bell, in 1859. In 1830, Redwood began business on his own account in Crawford Street, London, and while building up the dispensing business, manufactured some chemical and pharmaceutical products, devoting especial attention to the perfection of the preparation of extracts *in vacuo*. When, in 1841, through the energetic efforts of Jacob Bell and his associates the Pharmaceutical Society of Great Britain was founded, the establishment of a school of pharmacy was taken in hand, and the publication of the *Pharmaceutical Journal* was commenced, Mr. Bell being the editor and proprietor; but at his death the copyright was transferred to the Pharmaceutical Society. Mr. Redwood acted as sub-editor from the commencement until at Mr. Bell's death he became editor-in-chief until 1870, and remained a valued contributor to its pages until his retirement from active duties, in 1886. Pharmaceutical meetings were inaugurated by the Society in May, 1841, and beginning with January, 1842, were held in the home acquired by the Society at 17 Bloomsbury Square; in the promotion of the objects of these meetings Prof. Redwood was indefatigable; his influence upon their scope and character is best judged from the minutes as published in the *Pharmaceutical Journal*, which show the vast amount of information that he could impart on all subjects pharmaceutical.

Professor Redwood's career as teacher commenced with the opening of the school at Bloomsbury Square, in 1842, when he lectured on pharmacy, until in 1846 Prof. Fownes, owing to ill health, was compelled to resign the chair of chemistry, when both branches were entrusted to Prof. Redwood, who had already been in charge of the laboratory, opened in 1844, and enlarged the year following—the first one in Great Britain for instruction in chemistry and pharmacy by practical operations, in which the students were engaged throughout the day, under the guidance of a professor. To the Chemical Society he served as one of the secretaries from 1852 to 1865, and then as treasurer until 1870. He was also secretary of the Cavendish Society from its foundation in 1864, and honorary secretary of a committee of pharmacists,

appointed in 1854, to assist in remodelling the London Pharmacopœia. The first British Pharmacopœia published in 1864, not proving satisfactory, Professor Redwood prepared a new edition which appeared in 1867, and the addenda in 1874; he was also the pharmaceutical editor of the last edition published in 1885. When the British Pharmaceutieal Conference was organized in 1864, he was made one of the vice-presidents, and for two years, 1876 and 1877, he was elected president. In 1869 he represented the Pharmaceutical Society at the International Pharmaceutical Congress held at Vienna, and in 1881 he was made President of the fifth Congress which convened in London. In 1840, he prepared an English elaboration of F. Mohr's German work on pharmaceutical technics, which was subsequently republished in Philadelphia, having been edited and adapted for American pharmacists by the late Prof. Wm. Procter. Gray's Supplement to the Pharmacopœia was revised and rewritten by Prof. Redwood, and three editions were published in 1847, 1848 and 1857. He also edited several editions of Pereira's Selecta è Prescriptis, and for the abridged edition of 1872 of Pereira's Materia Medica, he contriouted the portion relating to chemistry and pharmacy. He was public analyst for the county of Middlesex, for the London districts of Holborn and St. Giles, and for the borough of Luton, assisted in these duties by his son T. Horne Redwood and by A. J. de Hailes.

Professor Redwood's life was one of well-directed labor extending over a period of sixty-six years, dating from the commencement of his apprenticeship. That he was appreciated as a teacher was shown as early as 1850, when about one hundred of his pupils presented him with a costly service of plate as an expression of their gratitude, and later, in 1887, when a subscription was started for the foundation of a scholarship, which was consummated in 1888, and will hereafter be associated with the research laboratory of the Pharmaceutical Society of Great Britain. The value of his labors in science was recognized by the conferring upon him by the University of Giessen, of the degree of Ph.D., when Liebig, in 1852, retired from that institution, to accept a chair in Munich. A number of societies conferred honorary membership upon him; among others, this was done by the American Pharmaceutical Association and by the Philadelphia College of Pharmacy.

VARIETIES.

Monochlorphenol is stated by Dr. Passerini (*Brit. Med. Jour.*) to be a powerful antiseptic free from the disagreeable odor and from the caustic and irritant action of trichlorophenol, and is recommended as an inhalation in tuberculosis and other pulmonary affections.

[There are three chlorophenols C_6H_5ClO, as follows:

Ortho	chlorophenol,	melting point	7°,	boiling point	175°
Meta	"	"	28·5°,	"	214°
Para	"	"	37.	"	217°

Editor Am. Jour. Pharm.]

Ichthyol, in doses of 0·01 to 0·02 gm., has been found useful by Dr. Thör in pyrosis, the sour eructations disappearing without leaving an disa reeable fter-effect.—*Med. Surg. Rep.*, Jan. 23, 1892.